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ABSTRACT

Patient classification systems in nursing, primarily limited to their application in hospitals, are the topic of this monograph. Following a brief introduction discussing their role and theoretical framework, the various uses of patient classification systems are discussed. Examples of patient classification systems in various settings are presented. These include medical, pediatric, psychiatric, and long-term medical care. A section on major issues in the selection and development of such systems follows. A comprehensive review of the literature on the subject is provided as well as an extensive bibliography. The monograph concludes with a discussion of the limitations and criticisms of the system and postulations as to future development in the field. (JD)

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Patient Classification Systems in Nursing: A Description and Analysis

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July 1978

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FOREWORD

Patient classification methodology represents a manpower planning tool uniquely developed for the nursing field. Although barely twenty years old, patient classification methodology has grown from use in a few selected applications to use in more than 1,000 hospitals in the nation today. The essential purpose of patient classification systems is the efficient and effective matching of manpower resources to patients' requirements for services. Interest in these systems is now extremely high because of their potential effectiveness in patient care, as well as in controlling health care costs.

In this monograph, Ms. Phyllis Giovannetti performs an outstanding service in bringing together a wealth of material on the theory and rationale of patient classification systems, and a detailed description of the major systems in use today. Also included is an extensive and up-to-date bibliography on classification systems which brings to the reader rich exposure to the literature in this field.

This publication is the fourth volume in the Nurse Planning Information Series. The series is composed of several selected monographs and bibliographies relative to health planning. Each publication in this series has been developed under contract with the Division of Nursing, Health Resources Administration of the U.S. Public Health Service, or as an information source by the Nursing Component of the National Health Planning Information Center (NHPIC).

The Nursing Component of NHPIC provides health planners with a centralized, comprehensive source of information on nurse manpower planning to facilitate an improved health care delivery system in the United States. The Component acquires, screens, synthesizes, disseminates, and makes available specialized documentary material on nursing, as well as methodological information on a wide variety of topics relevant to health planning and resources development.

The first three volumes in the series are:

Accountability: Its Meaning and Its Relevance to the Health Care Field
Nursing Involvement in the Health Planning Process
The Problem Oriented System: A Literature Review

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PREFACE

Planning for patient care is one of the most demanding and important issues facing health care providers today. Central to such planning are such issues as: what types of health care facilities? how many health care providers? what levels of health care personnel? and the quality of care? Although these issues relate to all providers of care, the impact of their resolution within the nursing profession is profound.

As the title of this monograph indicates, Patient Classification Systems in Nursing are discussed and reviewed in terms of their contribution to the planning for and provision of nursing care. Specifically, they deal with the types of health care facilities required and the organization of staff in terms of the numbers and levels of nursing personnel demanded.

The demand for patient classification systems in nursing has grown rapidly within the past decade. Two major documents have attempted to place them in perspective and to determine their role in dealing with the complex problem of nurse staffing. In 1973, Dr. Myrtle K. Aydelotte published a monumental document entitled "Nurse Staffing Methodology, A Review and Critique of Selected Literature." This publication contained a detailed, critical assessment of nearly 200 major methodological studies in the area of nurse staffing and a comprehensive bibliography of over 1,000 staffing studies. Patient classification systems were recognized as a vital component of many staffing methodologies. A companion document, "Research on Nurse Staffing in Hospitals, Report of the Conference," was published in 1972, and contained 10 papers presented at an invitational conference on nurse staffing. These papers focused on the variables considered to be significant in influencing the quantitative and qualitative demand for nurse staffing. Again, patient classification was presented as a means of determining patients' requirements for nursing care, an important variable within the context of nurse staffing.

This monograph attempts to deal specifically with patient classification systems in nursing, and is primarily limited to their application in hospitals. Although it is recognized that out-of-hospital health care settings are becoming increasingly important in the delivery of health services, the application of patient classification in these facilities is a recent advancement. The progress that has been made, however, is reported.

Following a brief introduction discussing their role and theoretical framework, the various uses to which patient classification systems have been put are discussed. Section III provides a comprehensive review of the literature which is now considered to be historical but, nonetheless, useful in highlighting the antecedents which have affected the format and design of the present-day systems. This is followed by

examples of patient classification systems in a variety of settings. A section on major issues in the selection and development of such systems follows. It is hoped that recognition of the major issues and concerns will initiate corrective action to ensure that the systems respond adequately to their many applications. The monograph concludes with a discussion of the limitations and criticisms of the systems, and postulations as to the future development in the field.

Although there are undoubtedly a number of very fine patient classification systems that are not reported in this monograph, the bibliography is nevertheless intended to serve as a comprehensive review of the literature, with special emphasis on systems that are widely recognized and reported in the nursing literature.

ACKNOWLEDGMENTS

I wish to express my sincere appreciation for the wise counsel and thoughtful advice which I received from Dr. Eugene Levine, Chief, Manpower Analysis and Resources Branch of the Division of Nursing, and Dr. John P. Young, Professor, The Johns Hopkins University. Their continued guidance and support contributed greatly to the production of this monograph. My thanks also go to Dr. Levine and Ms. Virginia K. Saba, Nurse Consultant, Division of Nursing, for their recognition of the importance of bringing this information to the attention of the nursing community.

I am also indebted to Ms. Kathleen A. Skapik, Project Manager, and Mr. Daniel P. Griffin, Managing Editor, National Health Planning Information Center, Aspen Systems Corporation, for their conscientious and expert assistance in writing and editing this monograph. Mr. Eugene Wall, Vice President, Aspen Systems Corporation, contributed heavily to the chapter on theory, for which I am grateful.

Special thanks are due to my colleague, Mrs. Dana Lewison, for her diligent work in searching the literature and providing a framework for the preparation of the manuscript.

Finally, I wish to thank the many individuals representing hospitals, research groups, and consulting firms who so willingly and promptly furnished me with the documents and illustrations referenced. Without such cooperation this monograph could not have been published.

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I. INTRODUCTION

Over the past 40 years, a great deal of attention has focused on the utilization of nursing personnel resources. Understandably, the center for this focus has been the acute care settings where nursing services represent the single largest item of hospital budgets. A recent study by Levine and Phillip(1975) revealed that within hospitals, the salaries and wages of nursing personnel account for 25 to 30 percent of total institutional costs. Thus, small percentage increases or decreases in labor costs can mean a substantial variation in total expenditure. Current utilization review committees and cost control measures are exerting strong influences for institutions to justify their requirements for nursing personnel, and the Hospital Cost Containment Act of 1977, if supported, will provide even greater pressure (H.R. 6575).

Concern and pressure are also very apparent from within the nursing profession. A recent survey among nurses to establish priorities in clinical nursing research ranked high the need for valid and reliable methods for establishing nursing staffing patterns that adequately reflect patient needs and cost containment (Lindeman 1974). Moreover, many State Nurses' Associations have successfully negotiated for staffing and patient care committees within their institutions. In some cases, these call specifically for the development of staffing patterns based on the care requirements of their clientele. The justification for the billions of dollars spent annually on nursing services will require that rational planning methods be used to ensure effective and efficient utilization of nursing resources. Decisionmaking based on "intuition," "pressures," and "precedents" will no longer be acceptable.

Traditionally, the determination and allocation of nursing personnel resources has relied heavily on global approaches which make use of fixed staff-to-patient ratios. It has long been recognized that these ratios are insensitive to both variations between institutions and among individual patients. The development of patient classification systems as means for assessing and quantifying the nursing care requirements of patients has been recognized as a viable alternative. Although not a panacea for all the problems of nurse staffing, they can and do contribute significantly to the problem of effective and efficient utilization of nursing personnel. The purpose of this monograph is to discuss their development and use them as planning techniques for the deployment of nursing resources. Most of the material presented relates directly to the short-term hospital setting, although patient classification in long-term care is discussed.

Nurse Staffing for Patient Care

Staffing is related to the numbers and kinds of personnel required to provide care to the patient or client. Staffing a nursing unit requires knowledge about the elements of a staffing program and the techniques necessary for its planning, implementation, and evaluation. According to Aydelotte (1973B), there are four elements of a staffing program:

1. A precise statement of the purpose of the institution and the services a patient can expect from it, including the standard and characteristics of the care;

2. The application of a specific method to determine the number and kinds of staff required to provide the care;

3. The development of assignment patterns for staff from the application of personnel guidelines, policy statements, and procedures;

4. An evaluation of the product provided and judgment reflecting the impact of the staff upon quality.

Although the purpose of this monograph is to focus on the second element -- the determination of the number and kinds of nursing personnel required -- the highly important and complex interaction of all four elements is recognized. What is perhaps not evident from the listing of the four elements of care, but equally significant, is the framework which pervades the elements of staffing. The framework for this interrelated system requires that a model of patient care be clearly defined. Freom such a model, it becomes evident that patient classification represents only one of the many factors which must be considered in determining nursing personnel resources. Although most of the literature relating to patient classification does not demonstrate a clear association between their use as part of a staffing methodology and the conceptual framework from which they were developed, such an association is important. The recent staffing study at San Joaquin General Hospital (1976) does provide an excellent discussion of the conceptual framework, and patient care models used for staffing can be found in Nadler and Sahney (1969), Giovannetti (1973), and Jelinek and Dennis (1976).

Concepts and Designs of Patient Classifications

Over the past 15 years, a great deal of attention has focused on hospital inpatient classification systems for the purpose of nurse staffing determination. The attention has ranged from basic research identifying the indicators necessary for a classification system to trial-and-error applications at the

institutional level. Numerous reports and articles have cited individual success stories lauding the use of patient classification systems, while others have written of their failures. It would seem, however, that the real and potential successes have outweighed the failures. An estimated 1,000 hospitals are presently using patient classification systems to aid in the difficult task of determining the quantity of nursing personnel required to provide an acceptable standard of patient care, and this number is growing daily.

The primary purpose of patient classification is to respond to the variable nature of the demand for nursing care. It has been frequently demonstrated in hospitals that there may be wide swings in the demand for nursing care from day to day and from shift to shift, and that these fluctuations are independent of the number of patients in the patient care unit. Only in patient care units where requirements for nursing care are largely homogeneous, such as in self-care units or in some highly specialized care units, is this not likely to be true. The impact of this variability is such that the number of patients in a nursing unit may not be an adequate indicator of the demand for care. Thus, the traditional methods for determining nursing personnel resources based on average care-hours per patient-day have been found to yield insensitive measures of demand.

The concept of patient classification entails the categorization or grouping of patients according to some assessment of their nursing care requirements over a specified period of time. The assessment may provide either a general indication or a precise measure of the amount of nursing care time involved. Similarly, the assessment may be directed toward certain aspects of patient needs, such as physical care, or relate to the entire gamut of requirements including, in addition to physical care, psychosocial care and teaching. Not all assessments of nursing care requirements involve patient classification. This monograph, however, deals primarily with those assessments which are used for patient classification. Throughout this monograph and the related literature, the terms 'demands" and "requirements" for nursing care are used interchangeably. It is recognized, however, that "demand" is more appropriately an economic term, while "requirements" is generally used as a generic term. The term "need" for nursing care is also commonly found in the literature but has been avoided here because it suggests evaluative measures that have yet to be established.

Two types of patient classification instruments are common in the nursing field and have been identified as "prototype evaluation" and "factor evaluation" (Abdellah and Levine 1965). The difference between the two methods relates to the actual design of the patient classification instrument. Instruments identified as "prototype evaluations" are characterized by broad descriptions and characteristics of the typical patient in each category. They are intended to establish several

mutually exclusive and exhaustive patient classification categories which are graded in terms of an ordinal scale in which each category represents greater or lesser requirements for nursing care. The methodology is applied by comparing the actual characteristics of a patient with those described in the prototype. The patient is classified into that category of care which most closely matches the prototype description.

The "factor evaluation" design involves the delineation of specific elements of care for which the patient is rated independently. Ratings on the individual elements are then combined to provide an overall rating which, when compared with a set of of decision rules, identifies the appropriate care category. This method also intends to provide mutually exclusive and exhaustive categories graded in terms of an ordinal scale. The end product of the two types of classification instruments results in the assignment of a patient to a specific care category. The scale for the two types can also be the same, but the difference lies in the method of rating.

The two types are also commonly referred to as "subjective" (prototype evaluation) and "objective" (factor evaluation) patient classification instruments. In the early stages of development, it was felt that the prototype evaluation with its broad descriptions could too readily be interpreted differently by different nurse raters. A great deal of subjectivity appeared to be involved in the selection of the patient category. On the other hand, the factor evaluation type, by enumerating specific condition states or descriptors, was thought to result in total objectivity on the part of the rater. It is now recognized that the labels of "subjective" and "objective" are misleading and, indeed, some measure of subjectivity on the part of the rater is and should be involved in both types.

The number of categories or classes in patient classification instruments is highly contingent upon the degree of precision required and the diversity of the care requirements of the patients. The most usual is three or four, although some instruments have been developed with as many as nine. The labels given the categories generally range from Category I(minimal or self-care) to Category III or IV (intense or complete care). The indicators or descriptors used to classify patients are fairly universal and generally include: factors relating to the patient's ability to feed and bathe himself, mobility status, special procedures and treatments, observational needs, and instructional and emotional needs. These descriptors are commonly referred to as the critical indicators of care. Determination of the nursing care time associated with the Critical indicators provides the quantification of the patient classification instrument. This is usually based on the results of extensive activity studies conducted on the nursing unit. A discussion of the critical indicators and the quantification techniques, along with other major issues, is presented more fully in Section V of this monograph.

The most common application of a patient classification system begins with the head nurse classifying all the patients on a nursing unit once per shift. This is usually done in a predictive manner so that care requirements for the next shift will be determined in advance. Based on the quantification identified for each category of patient, an estimate of the direct care workload is derived. The direct care workload is then added to the time required for indirect care activities and all other nursing personnel activities. The result is an estimate of the total man-hours required. This is matched to the man-hours scheduled for that shift, and staff allocation is altered on the basis of the match. Having quantified the care requirements of patients according to their designated category of care per shift, the concept of global average hours per patient-day as a standard for determining staffing requirements is replaced by a method which is more precise and more responsive to changes in patients' status. Although some patient classification systems are computerized, most involve little effort and time on the part of nursing staff and do not of themselves require the use of a computer.

In addition to planning assignments of nursing personnel, patient classification systems have been beneficial in a variety of other areas. These include: the organization and administration of patient care units, budgeting for long-range staffing requirements, admission scheduling of patients, assignment of nurses to patients, and as a basis for determining patient charges. A detailed discussion of the uses of a patient classification system follows in Section II.

Although patient classification systems as methods for staffing are far from perfect, they provide measurable improvement over methods that leave to chance that the right number of nurses will be available to respond to the needs and demands of patients at the right time. The major limitation, and frequently cited as a criticism of patient classification systems, is their lack of attention and response to the issue of quality of care. Without an acceptable and adequate measure of quality of care for nursing service, it is difficult to prove that the assessment of patients' requirements for care are indeed representative of their true needs, and that once having determined the desirable personnel, they in turn will deliver quality patient care. Another major limitation is the lack of well-defined criteria within patient classification systems which can serve to determine the appropriate mix or levels of nursing personnel required. These issues and others are discussed more fully in Section III.

Patient classification systems have been developed primarily for medical, surgical, obstetrical, and pediatric patients in the acute care settings. Similar developments in psychiatry and long-term care are more recent, although much work is still to be done in these areas. There are virtually no applications of the systems in the field of community or home health care. Examples of implemented systems in a variety of settings are contained in Section IV.

Classification Theory

An understanding of the theory of classification in general is important as it aids in explaining the rationale for classification schemes, their principles, and their purposes. The process of classifying is defined as the ordering or arranging of objects or concepts into groups or sets, based on relationships among the objects or concepts. This process of classifying attempts to gather together similar objects (at least conceptually but often physically also) or concepts, to separate dissimilar objects or concepts, and to provide a degree of separation proportionate to the degree of dissimilarity. The relationships among objects or concepts by which similarity and dissimilarity can be determined can be based on observable or inferred properties (Sokal 1974).

A fundamental problem in classification -- and, for that matter, in communication generally -- is that of viewpoint. Different points of view invariably result in different assessments as to the degree of similarity of two objects or concepts; that is, different viewpoints result in different degrees of importance being assigned to each observable or inferred property and, hence, in different assessments as to similarity or dissimilarity. Consider the matter of waxen fruit used as a table centerpiece. From the viewpoint of visual appeal, waxen fruit has the properties of permanence (resistance to decay) and attractiveness (the very most attractive fruit can be simulated rather than the usually available run-of-the-mill fruit). From the viewpoints of gustation or nutrition, however, waxen fruit leaves much to be desired.

Is waxen fruit very similar to actual fruit? Or is it very dissimilar? Of course, the answer is: "It depends on the properties of fruit which are most important to the person determining the degree of similarity -- i.e., on the viewpoint of the classifier." For example, a nursing administrator may desire a classification scheme based on amount and kind of care required; the clinician may be more interested in the scientific principles of care, and the researcher may consider patient care from both perspectives but require further knowledge of the dynamics of patient care. This is not to suggest or limit the domain of viewpoint, interest, or concern of any one person, but to point out that there are many viewpoints and the particular properties selected as the bases for classification will be determined by the viewpoint of the investigator.

The primary purpose of classification is thus to arrange objects or concepts such that their "true" relationships are displayed. This simplifies relationships between objects and between classes of objects, permitting the use of general statements about the classes. Classification also permits economy of memory. The definition or description of each class

or subclass subsumes the individual definition or description of the objects contained within it. The value of a classification scheme lies in the achievement of greater power for ordering and controlling the concepts involved and the provision of convenient labels to enhance communication. It must be recognized, however, that any classification scheme represents an attempt to abstract and to order phenomena and, as such, probably does (in the eyes of some users) a certain amount of violence to the phenomena observed. The most that can be expected of any classification scheme is the achievement of a minimum overall level of dissatisfaction on the part of its users.

So much for defining the problem of viewpoint -- one of the four fundamental problems in communication, the others being those of generics, semantics, and syntax. Classification schemes are directed principally at solving the generic problem (once a viewpoint is selected on which the scheme can be based). The generic problem can be expressed by the simile: "When I cut off a branch of the tree, I expect the twigs on that branch to be removed also." By arranging objects or concepts in classes, subclasses, etc., the members of the classes, subclasses, etc., can be easily named and related to each other. This permits ease of manipulation and a convenient means of information retrieval. Finally, a major scientific justification for establishing classifications is that they are heuristic; they lead to the stating of hypotheses which can be tested.

The third fundamental problem -- that of semantics -- is concerned with terminology. The terminology of a particular classification scheme is closely related to the standard nomenclature used to describe the phenomena of interest. In this manner, patient classification schemes for nurse staffing make use of the current terminology used to describe the elements or components of care. The semantic problem has two facets: synonymy and homography. Synonymy occurs when two or more terms signify the same concept (object, element, property, etc.); homography occurs when two or more concepts are ambiguously signified by the same word. Consider the synonyms chemotherapy, drug therapy, treatment with drugs, etc. Clearly, the most acceptable synonym must appear in the terminology of the classification scheme, but cross-references from the nonpreferred synonyms to the preferred one must be provided. Now, consider the homograph stock; does it mean "inventory," "securities," or "soup base"? The terminology of the classification scheme should make the meaning clear. Often this is done by appending a parenthetical qualifier to the ambiguous word -- for example, stock (inventory).

The final fundamental problem is that of syntax. The terms employed should be syntactically unambiguous. When a multiple-word term is used, it should be clear what word modifies which other word. A popular song (?) of two decades ago spoke of a "one-horned, one-eyed, flying purple people eater."

Was this a horrible creature dangerous to all people -- or was it a creature defined as being dangerous only to one-horned, one-eyed, flying purple people? While this example is -- of course -- facetious, we are all guilty of ambiguous syntax from time to time; care must be taken in the construction of the terminology in any classification scheme to avoid syntactical ambiguity.

The problems of communication having been defined with respect to the process of classifying, let us proceed to the mechanics of problem solution. The solutions to the problems of syntax, homography, and synonymy are relatively simple and have been indicated above--in general terms. The generic problem can be solved relatively easily by identifying the classes and subclasses into which each concept should be slotted. Unfortunately, solution of the viewpoint problem is first required so that the classes and subclasses can be defined. In practice, classification schemes must serve different viewpoints, and hence each of many concepts may have to be assigned to multiple main classes and/or subclasses. This results in a polythetic classification scheme.

It is essential that the classifier recognize the difference between monothetic and polythetic schemes, and that polythetic schemes are required in nearly all real-world cases. These two types of classification schemes have been defined as follows:

> Monothetic classification schemes are those in which the classes established differ by at least one property which is uniform among the members of each class.
>
> Polythetic classification schemes are those in which the classes are groups of concepts or objects that share a large proportion of their properties but do not necessarily agree in any one property (Beckner 1959).

Sokal (1974) stated that a corollary of polythetic classification is the requirement that many properties or characteristics be used to classify objects. Once a classification has been established, however, few characteristics are generally necessary to allocate objects to the proper class. Patient classification schemes for nurse staffing are recognized as polythetic, and their development coincides with the principles of this type. Many properties were necessary originally to identify the classes, but as they became established, patients could be allocated to the proper classes on the basis of a very few characteristics. The relationship between classification schemes based on many properties and classification schemes based on few properties is closely associated with economy and precision. The former are not likely to be optimal for any single purpose, but could be useful for a great variety of purposes. Thus, for practical purposes, special classification schemes, based on few although limiting properties, are desirable.

It should be emphasized that classification does not necessarily mean that objects of a given class -- or patients in a given class -- are identical, but rather that they are more similar to each other, with respect to certain characteristics, than they are to nonmembers of the class. When a classification scheme is being developed, the definition and selection of main classes and subclasses may be evident from the natural structure of the phenomena at hand, or they may be imposed. Considerations of practicality and purpose play a major role in the design of of the scheme. Certainly, the selected classes should be collectively exhaustive of the subject matter at hand. Ideally, each class should be mutually exclusive -- classes should not overlap. However, it has already been shown that some overlap is usually unavoidable because of variations in viewpoint which must be accommodated.

The formerly attractive notion of nonoverlapping or mutually exclusive classes is presently undergoing reexamination because the utility of overlapping clusters appears far preferable (Sokal 1974). The mystique or unique know-how of a good builder of classification schemes is that of how not only to provide for collective exhaustivity of classes and subclasses, etc., but also how to consider all viewpoints to be served while simultaneously achieving as much mutual exclusivity as possible. Such an achievement requires (1) a knowledge of the subject matter to be classified, (2) an innate (?) capability for gestalt -- to approximate initially and then to refine iteratively the selection of classes which are as mutually exclusive as possible, and (3) experience in the mechanics of implementing classification schemes. The last is concerned with ensuring internal consistency, providing ease-of-use, and minimizing cost and elapsed time in preparing a classification scheme.

Classification is only one means to an end, and by itself is of little value. Patient classification, as it is discussed herein, has as its goal the rationalization of at least two elements: How much nursing effort is required per each patient in a given class, and of what character? Given these data, it is possible to project the overall or total character and amount of care which need be provided -- given also data as to how many patients of each class must be provided with care. This last can be estimated for the next shift (or day) based on the classes or patients on hand. It can be estimated for the longer range (for the next year) by observing maxima, minima, and mean trend lines of numbers of patients cared for over the last several years.

Definitions

The following terms are defined as used in this monograph. Since the developments of many contributors are a major part of

this document, these terms are not always consistent. However, where possible, deviations from these definitions are noted.

Patient Classification, or Patient Classification Instruments, refer to the tools used to group or categorize patients into a number of care categories according to the perceived requirements for nursing care time.

Patient Classification System is the term used to encompass not only the process of identification -- the patient classification instrument -- but also the quantification of the categories of care into some measure of the nursing effort involved. Most commonly, the quantification is based on the nursing time involved in direct patient care.

Staffing Methodology is a systematic process encompassing all the procedures and methods used to determine the number and kinds of nursing personnel required to provide nursing care of a predetermined quality to a specific group of patients. It includes: the assessment of patient requirements through the application of a patient classification instrument, the implementation of the system through scheduling of nursing personnel, and evaluating the match between workload and staffing.

Direct Nursing Care Time refers to the time spent by nursing personnel in the presence of the patient and/or family. Frequently this occurs at the patient's bedside, although not exclusively.

Indirect Nursing Care Time refers to all nursing care time spent by nursing personnel not in contact with a patient. In some studies reported, indirect nursing care time refers more specifically to activities away from the patient but in preparation for or in completion of direct nursing care. In these instances, unit-related activities and personal time are considered separately.

II. PATIENT CLASSIFICATION USES

The most appropriate and significant contribution of patient classification systems as they exist today has been in the area of planning for the deployment of nursing personnel resources. They have served to aid in a wide variety of other functions as well. Their usefulness, however, is highly contingent upon the precision of the method selected, the degree of implementation throughout the health care facility, and the level of understanding and acceptance by all hospital personnel. The following discussion of uses assumes the availability of a valid and reliable classification system which has been implemented in a timely and efficient manner. In no instances is it implied that patient classification should replace all other types of information. Patient classification information should be viewed as a minimum data set to be supplemented by other data sources.

Determination and Allocation of Nursing Personnel

Evidence that there is little correlation between numbers of nursing personnel and patient care workload on a nursing unit has been obtained through numerous studies. This partly is due to the unpredictable and highly variable nature of the demand for nursing care. Because of the desirability of maintaining cohesive work groups, it is necessary to assign a quota of nursing staff to each patient care unit. Matching supply with demand cannot be achieved in an unplanned and impersonal manner. The dilemma then is one of determining the number of nursing personnel that should be assigned to a nursing unit and obtaining timely information about when to augment or decrease that number. Patient classification systems can have a significant impact in dealing with this dilemma both in the short run and for long-term-budget forecasting.

The first application in this area is the determination of the baseline or permanent staffing positions required on each nursing unit. When daily patient classification is plotted over a period of time, the magnitude of the fluctuations in the demand for care can be observed. This information is used to aid in determining the size of the baseline staff for each nursing unit. In some instances, decisions have been based on an estimate of the average workload; in others, the choice has been to select minimum staffing levels. Factors which need to be considered in determining the size of the baseline staff include: the number of nursing units with similar type patients, the availability of permanent and part-time nursing personnel of all levels, and the policies and practices of the institution. In the absence of control measures taken by hospital administration to alter the stochastic nature of the demand for

care, the estimate of the number of patients in each patient category for a subsequent shift provides the information necessary for augmenting or decreasing the numbers of nursing personnel assigned to each unit.

Although hospitals differ in their application of this form of variable staffing, most have recognized the need for such flexibility. The most common practices involve transferring staff from low workload units or establishing a float pool. Since the fluctuations in care demands from unit to unit have been found to be independent, some control is permitted over the size of the float pool which must be maintained. The opportunity for at least a minimum of planning is afforded by the determination of workload in advance of each shift. Much discussion has centered on the use of float or relief personnel, most of which relates to the question of job satisfaction. Indiscriminate allocation of float personnel can lead to job dissatisfaction. However, if expertise, specialization, and knowledge of the previous placements of nursing personnel is considered in the assignment, job satisfaction need not be lowered (Thomas 1972, Bahr and others 1977).

The observation of workload levels above or below that which can be managed by the scheduled staff does not automatically dictate the need for adjustment. A number of other variables are significant and should be considered. First is the recognition that patient classification information should be used to augment and not replace professional nursing judgment. The presence of nursing students on the unit, an exceptionally competent nursing staff, and/or a large number of patients considered to be at the lower end of their care ranges may be indications that a high workload can be adequately handled by the scheduled staff. Similarly, planned inservice educational programs, new personnel, and other factors may require the addition of nursing personnel. Consultation with the head nurse should be a part of decisions to increase or decrease the numbers of nursing personnel.

Patient classification systems have also served to provide the rationale for improved cyclical staffing programs. Frequently, patterns in the daily fluctuations of care requirements, such as consistent increases or decreases in the workload on weekends, are observed, and this information, coupled with admission and discharge patterns, is useful for improved personnel scheduling practices. However, many other variables need to be considered. A good review of the literature on scheduling can be found in the report by Jelinek and Dennis (1976). Cost savings may result because of improved allocation techniques, but the implementation of a patient classification system should not be used for cost containment alone. In many cases, reported dollar savings have resulted primarily from staffing practices that had maintained high baseline levels of nursing personnel in the units in anticipation of peak workloads. Many other institutions, however, have been found to have an inadequate number of baseline staff assigned to the nursing units.

Determination of Categories of Nursing Personnel

Mostly, classification systems do not provide definitive information on the appropriate mix of personnel, nor do the systems supply standard staffing ratios that can be transferred from setting to setting. A number of reasons for this limitation can be mentioned. First, an unlimited supply of all types of nursing personnel does not exist from region to region; therefore, mixes often reflect availability. Second, variability among institutions exists in the performance of personnel of the same level. This is partly due to job descriptions specific to institutions and the special in-house training programs which may be provided to personnel. Third, the nature of the nursing care required may differ from institution to institution, involving different complexities of nursing tasks. Fourth, the type of care delivery system; for example, team or primary nursing may demand specific mixes of staff. Fifth, the philosophy of care of the institution has its special input on staffing size and mix.

Recognizing the limitations imposed by these caveats, individual nursing units and institutions can use patient classification information to aid in the formulation of policies on the mix of nursing personnel. Some general guidelines frequently used include the assignment of intensive care patients primarily to registered nurses with some assistance from other levels of staff, or intermediate care patients to licensed practical nurses while maintaining registered nurse supervision and the assistance of nursing aides. In the absence of valid measures of the quality of nursing care, confirmation of the appropriateness of established guidelines is difficult.

Planning Nursing Assignments

Advance knowledge of the care requirements of individual patients can greatly facilitate the assignment of nurses. It has long been recognized that individual nurse assignments which include patients with widely different care requirements is undesirable (Sjoberg and others 1971). Patient classification information permits the assignment of equitable workloads as well as a mix of patients which does not demand wide variations in the provision of care. The systems also offer information helpful to the assignment of students or new graduates to assist them in obtaining work experience. Brya and Pierce (1974) and Jenkinson and Weinstein (1975) outlined the use of reporting mechanisms to monitor the equitability of nursing assignments and to provide a log of individual nurse experience.

Once again, patient classification information should be used to assist professionals in making assignment decisions, rather than to dictate these decisions. Many other variables

such as continuity of patient care and special knowledge and skills possessed by individual nurses must also be considered when planning individual nurse assignments. Recently, Freund (1974) reported on a staffing methodology that considers the "difficulty" of nursing activities which can be used to aid in the assignment of all levels of nursing personnel. Most studies report that the availability of patient classification information and its application to assignment of nursing personnel has led to the improvement of staff morale.

Effective Personnel Utilization

The development of patient classification systems has resulted in the systematic evaluation of the methods, procedures, and facilities for the delivery of care. The extensive activity studies conducted in hospitals to quantify the categories of care and the activities of nursing personnel have provided detailed information on the practice of nursing care. This information has revealed that, in many cases, the manner in which scarce and costly nursing resources are managed could be measurably improved. The improvements include redistribution of the activities of nursing care to reduce the peak workload that occurs during certain periods of each shift. In some cases, changes in the scheduled times for routine treatments and medications and staff mealtime and coffeebreaks have resulted in a more constant level of care throughout the day. Changes in the design of the nursing unit and the availability of equipment and supplies can also improve the utilization of personnel time.

Recognition of the need for more detailed and timely information on job descriptions for all levels of personnel has been identified and has contributed to necessary changes in organizational responsibility. The list of alternatives that can provide more effective and efficient utilization of nursing personnel is lengthy. However, the actual changes that occur are largely dependent on the commitment of all persons engaged in providing care. Some institutions have expanded the application of utilization measures to provide coefficients of productivity which can be measured and monitored on an ongoing basis. These efforts are closely tied to the use of management reporting systems. A number of interesting accounts of improved utilization are available and include reports by Harris (1970), Saren and Straub (1970), Sjoberg and Bicknell (1971), Gabbert and Parkinson (1974), Clark (1977), Jackson and Kortge (1971), and Brya and Pierce (1974).

Charging Patients

Although it has become common practice for hospitals to use a separate charging procedure for patients in intensive care units and to a lesser extent in self-care units, some hospitals are now beginning to charge patients on the basis of their nursing care requirements as revealed by the classification system (Knowlton and Dunn 1971, Holbrook 1972, St. Luke's Hospital Medical Center 1974). Each of the care categories is established to recover costs incurred in providing the care required to meet the patient's nursing care needs. In this manner, a more equitable cost basis is offered to the patient, and the nursing department becomes correctly identified as a revenue-producing department.

By relating costs to charges, it is hoped that some contribution will be made to cost containment in this sector of health care delivery. The use of a daily patient classification system for charging patients requires a great deal of commitment by the hospital, the public, and the third-party payers. The hospital must stand ready to justify the patients' care category and ensure that the service is commensurate with the assessment of care requirements. Potential problems that may arise because of unanticipated changes in a patient's category and the variances that necessarily occur within each care category have yet to be addressed. The question of accountability will become a much more critical point of negotiation between all parties to the agreement.

Placement of Patients

Patient classification systems can aid in the placement of patients on admission to a particular nursing unit and in some instances to particular beds within a unit. Although the assignment of a patient to a nursing unit must generally consider such factors as sex, service, type of accommodation requested, and bed availability, additional considerations may be used as appropriate. Many institutions have established relationships with the attending physician and the admitting department so that placement also considers the existing level of the workload on the nursing units. The assignment which is most favorable to matching workload to available staff is selected. In this manner, the occasions requiring the relocation of nursing staff to meet the peak demands can be lessened.

Some institutions have been successful in extending this concept to the point of selecting patients for admission, particularly those scheduled for elective surgery. Although admission for elective surgery has generally been on a first-come-first-served basis, deliberate selection of a patient who will require less intense care at a time when workloads are at

a peak can be justified. Assignment of patients to particular beds within a nursing unit has also been facilitated by the knowledge of a patient's care category. The Saskatchewan studies resulted in a new concept of ward organization based on patient classification -- the Unit Assignment System. In this system, the nursing unit is decentralized and divided into units corresponding to classification categories. The patient's category of care on admission and an estimate of his future classification profile assign him to the "unit" within the ward most geared to meeting his needs. Since the units are flexible, they can be expanded or contracted, thus limiting subsequent movement of the patient (Sjoberg and Bicknell 1969 and 1971).

Finally, patient classification can provide a basis for determining the most effective facilities for providing care. The original work in the area of Progressive Patient Care focused on this point. Although many hospitals are organized to provide separate facilities for intensive care patients and self-care patients, a patient classification system serves to monitor transfer to and from these facilities in a timely fashion. Recent developments in patient classification systems in long-term care hold promise for the determination of appropriate programs and facilities in this area.

Other Uses

Many other uses of patient classification systems have been reported, such as allocating equipment and supplies, monitoring patients' dependency levels, and for various research efforts. Certain equipment and supplies are needed with greater frequency among different categories of patients. The Johns Hopkins studies revealed a significant correlation between care categories and linen requirements, and their patient classification system was used for many years to allocate linen supplies (Flagle 1975). Others have reported the value of patient classification information in establishing inventory levels for a wide variety of standard supplies.

Monitoring a patient's category of care during his hospital stay can provide useful information, such as indicating when a patient could be discharged or transferred. Goldberg and Holloway (1975) suggested that level of care, rather than length of stay, should be the major decision criterion for utilization review. The Oxford studies and those of the Hospital for Sick Children in Toronto, Canada, reported the use of patient dependency chains to monitor a patient's progress during hospitalization and to aid in the assignment of registered nurses (Oxford Regional Hospital Board 1967, Jenkinson and Weinstein 1975). Berry (1974) recommended that the information be used to develop patient recovery models. Knowledge of patients' care categories, diagnoses, and day of stay could be analyzed to predict patient recovery models that would

provide more precise data for budget and staffing decisions. The models could also be used by clinical nurse practitioners to anticipate patients° needs for care.

Many researchers have used patient classification information to control the potentially confounding variable of differences in the magnitude of nursing care requirements. The Medicus Corporation, in the development of a methodology for monitoring quality of nursing care, used patient classification to identify and group the criteria selected for evaluating quality (Jelinek and others 1974). Finally, one of the purposes of a classification system is to generate hypotheses. As a result of classifying, it is expected that questions will be raised. Although the fact that questions are raised may be thought to reflect some inadequacy in the classification system itself, this is a constructive process that can lead to new insights.

III. HISTORICAL DEVELOPMENTS

The history of patient classification in nursing dates back to the period of Florence Nightingale when an informal classification method reflecting nursing workload was used. Based on intuition, perhaps, the most seriously ill patients on the large, open Nightingale wards were placed closest to the ward sister's office to facilitate their observation. On the other hand, those patients who could fend for themselves tended to be located at the far end of the ward, indicating their decreased dependency on the nursing staff. As expressed by Baar (1973), the prime disadvantage of this approach in any broad-based area of application is the tendency for different views to surface as to what constitutes high and low dependency. Moreover, the relationship between the dependency level of the ward and the required staffing numbers can only be established by referring to the existing staffing situation.

One of the earliest attempts to identify the needs of patients in a quantifiable, operational, and comprehensive fashion involved a study of 50 selected hospitals in New York. The notion of a patient classification was perhaps not foremost in the minds of the investigators, but the findings of the study had a major effect on the development of such systems in the years to follow. As a result of the study, the figure of 3.4 to 3.5 total nursing hours per patient-day was recommended and became widely accepted. What was important, and what perhaps was frequently overlooked, was the discussion that followed this recommendation:

> The fact that stands out clearly, however is the need for information based upon sound investigation of the factors essential for organizing and evaluating hospital nursing service. The recommendation that all hospitals provide at least the <u>average number of hours</u> of bedside nursing found to be available on the median and typical ward units is submitted <u>not because they are known to be right</u>, but because from the information offered by this study it would appear to be a practical recommendation for the present. <u>The next step is to determine what the right number of hours of nursing for the various categories of ward patients should be</u>. (National League of Nursing Education 1937).

For the most part, the "practical recommendation for the present" was accepted. The figure of 3.4 to 3.5 hours per patient-day became a goal for those hospitals which were below that figure and a limitation for those hospitals which were above that figure. This marked the beginning of the use of global averages as standards for nursing care. It was many years before the next step recommended by the League received any serious attention.

Early Classification Attempts

The emergence of rising health care costs and manpower shortages led to the first concrete effort to classify patients according to intensities of nursing care requirements. In 1947, the National League of Nursing Education, in its study of Pediatric Nursing, published a four-category factor evaluation classification system designed for pediatric patients (National League of Nursing 1947). The factors considered were: (1) the degree of illness, (2) the extent of activity, (3) the number and complexity of treatments and procedures, and (4) the nature of adjustment. Each of the factors was rated in terms of a three-point scale of intensity. Using the criteria, a profile could be drawn for each patient showing the degree to which he possessed each of the four factors. An attempt was made in this study to relate the amount of nursing time required to the classification of the patient, but it was done in gross terms only and did not provide a sensitive tool for determining staffing (Abdellah and Levine 1965).

The extent to which this system was utilized is unknown. However, it likely influenced another National League of Nursing Education study in 1948 which developed a similar classification system for the assignment of nursing aides (National League of Nursing 1948 and 1949). The criteria used in this study include all of the factors in the Pediatric Study as well as an additional one relating to teaching or rehabilitation. Again, each criterion had three levels. The profile of care requirements for each patient was intended to aid nurses in deciding which patient could appropriately receive care from the hospital-trained aides. No mention was made of nursing involvement in terms of care time in either report. However, they are significant for two major reasons. First was the notion that there are similarities in care requirements of individual patients, thereby permitting the concept of grouping patients in clusters. Second, and probably more important, was the recognition that the patients' degrees of illness (acutely ill, moderately ill, and mildly ill) do not necessarily reflect the intensities of the nursing care demands.

The three levels of patient acuity were again used in a study by Wright (1954) involving four hospitals during the early 1950's. Armed with the knowledge that a heavy census and a shortened patient stay meant more work generally, the investigators wanted to know how ill their patients were for how much of their stay. Instead of taking the factor evaluation classification criteria developed by the National League of Nursing Education, the investigators used only the three acuity levels: Acutely ill, moderately ill, and mildly ill. In this manner, a prototype evaluation based on the intensity of symptoms was formed and used to classify the patients.

At this time, and certainly a strong impetus for the conduct of the study, was the increasing competition for manpower faced by the hospitals. Knowledge of the patients' acuity level was seen as the most feasible way of determining the proportion of professional to nonprofessional staff for care assignments:

> If a patient is in an acute or critical state his care devolves almost exclusively on professional nursing; as his condition is improved, his care can in some measure, be entrusted to less skilled personnel. This is increasingly possible with the addition to our staff of practical nurses, aides and other assistance. But always the patient's condition controls the care assignments (Wright 1954).

When the findings of several wards were compared, vast differences in the percentages of patients' time spent in each of the three acuity levels were revealed. It was concluded that there can be no ideal pattern covering staffing, except as it fits the precise circumstances to be found not only within a hospital, or within a service, but also within a nursing unit. This led to perhaps one of the first attempts to quantify the care requirements of patients in each of the three levels. A staffing pattern was developed based on the amount of time spent on patient care activities, but again the focus was primarily on the time consumed by each category of nursing personnel. The end product was a ratio of professional to nonprofessional staff and a reversion back to the notion that one nurse can manage X-number of patients.

The University of Pittsburgh School of Nursing launched a study in 1950 to determine the nursing services required by a group of medical and surgical patients (George and Kuehn 1955). After nine different mixes of nurses and patients had been evaluated, a master staffing pattern was developed. The notion of patient classification was considered, and a four-category prototype evaluation was identified and established as: "critically ill," "acutely ill," "moderately ill," and "mildly ill." Patients were classified daily, and time studies were conducted to determine the average care-time per category. The amount of care-time within each of the acuity categories was found to vary widely. On the basis of this finding, perhaps, acuity ratings were used as only one of many descriptors of the study unit. Acuity did not become a part of their experimental patterns of different combinations of patients and staff.

The observations in acuity levels nevertheless are significant. The study reported that a different kind of care is often needed for patients classified as mildly ill, since it is during the convalescent phase that the major part of health teaching is undertaken. For this reason, more time than that required for treatments and medications ordered for acutely ill patients may be necessary. Moreover, patients whose emotional

reactions are not in keeping with their physical condition, even though they may be classified as moderately ill, may also require as much or even more nursing time than those whose general condition is considered to be more serious. The study concluded that "the degree of physical dependency was only one factor to be considered in developing and executing the total plans of patient care." (George and Kuehn 1955).

At about the same time, a project undertaken at New York University expanded slightly the definitions of the three levels of acuity to incorporate not only symptoms but also references to the patients' activity, behavior patterns, and the necessity of providing specialized skills. Patients were categorized according to the prototype evaluation, and after continuous observational studies, the average care-time for a 24-hour period was recorded (Bernstein and others 1953). It appears that staffing recommendations were then made on the basis of an average mix of patients which was assumed to remain constant over time.

In 1951, the U.S. Army Medical Services began experimenting in the area of patient classification for nursing care at Walter Reed Army Hospital in Washington, D.C. In various studies, the classification categories have ranged from nine to three (Claussen 1955). The classification instrument that was eventually accepted as the Army method was a prototype evaluation containing four categories. Only three categories reflected the nursing needs of hospitalized patients on the active wards; the fourth category was applicable to the convalescent patients not generally cared for on the active wards. The care categories were identified as: "intensive," "moderate," "minimal," and "supportive."

The factors found to influence the classification of patients were identified as: (1) nursing procedural requirements, (2) physical restriction, (3) instructional needs, and (4) emotional needs. These factors were incorporated into a prototype evaluation, thus restricting the assignment of a patient who, for example, had high emotional needs but limited nursing procedural requirements. Moreover, the lack of operationally defined adjectives such as "frequent," "same," "more," and "moderate" used as descriptors limited the sensitivity of the instrument and provided little assurance of their consistent application. Nevertheless, the system was an improvement over the practice of using global average care-hours per patient day as the standard, and came to serve as a model for much subsequent work in the area. Average hours of nursing care required for patients in each category were determined by time studies, and when multiplied by the number of patients in each category, provided an estimate of nursing personnel requirements. The information was apparently used for establishing staffing patterns and requirements, and as an overall data collection instrument to aid in the management functions of planning, directing, and controlling.

During the same period that the Army was conducting its research on patient classification, the Division of Hospitals of the U.S. Public Health Service was developing a four-category prototype evaluation for use in its hospitals. The instrument finally developed was similar to the Army system but with some exceptions. More factors were delineated for consideration in the selection of the appropriate care category with the appearance of greater attention to nonphysical nursing requirements. The categories were relabeled to read "minimal care," "partial care," "full care," and "complex care."

A new approach to patient classification was developed at the Division of Nursing Resources, U.S. Public Health Service, as part of a project on comprehensive patient care. In a joint study with the Office of Defense Mobilization, the prototype evaluation was expanded to a factor evaluation. Six factors were delineated: (1) "observation," (2) "emotional support," (3) "medications and/or treatments," (4) "assistance with hygiene," (5) "tests," and (6) "teaching." Patients were rated on each factor according to a four-point scale of intensity of need. The ratings were then grouped into four classification categories. In 1957, the Division of Nursing went a step further by assigning a point value according to a four-point scale to each of the six factors. In this manner, each patient was rated on each of the six factors independently. This reduced the opportunity for the raters to be disproportionately influenced by one factor in determining the appropriate category of care. Patients could receive anywhere from a minimum of 6 to a maximum of 24 points. Ranges were established to represent each of four overall categories of care: "intensive," "moderate," "minimal," and "outpatient department-type" care. These quantitative scaling techniques enabled the user to increase the number of categories if desirable.

Progressive Patient Care

During the late 1950's, the concept of patient classification assumed a much broader base as the attention of hospitals focused toward a reorganization in their approach to patient care. The movement was known as "progressive patient care" (PPC), which consisted of the systematic classification of patients according to their medical and nursing care requirements. One of the first investigations in this broader area of classification was conducted at the University of Kentucky Medical Center (Noback 1958). The purpose of a classification system was to determine the type of facilities needed, the amount and kind of nursing services required for each, and the proper allocation of patients. The investigation began by recording all services provided to the patient. Based on the assessment of over 100 items of information collected on each patient, the patients were grouped into four categories: (1) "critical," (2) "intensive," (3) "standard," and (4) "minimal"

care. In contrast with the previous prototype evaluations which assessed the critical nature of the illness, the definitions relating to these new categories stressed the extent of services required.

A similar investigation was sponsored by the U.S. Public Health Service and undertaken at the Manchester Memorial Hospital in Manchester, Conn. The concept of progressive patient care was further defined to include the categorization of patients according to their degree of illness and need for care (Haldeman and Abdellah 1959). Six categories of patients were defined: "intensive," "intermediate," "self," "long-term," "home," and "outpatient" care. The first three related to patients in the acute care setting. To determine a patient's placement in one of these categories, a checklist was used. Sixteen criteria were selected for the factor evaluation because of their sensitivity to the nursing care needs of patients. Mostly, they related to physical components of care such as TPR, bath, mobility, and the presence of certain condition states such as hemorrhage, level of consciousness, and the need for isolation.

Each of the 16 criteria had 2 or more indicators which were designated as: (1) "compelling" (2) "moderate," or (3) "contra"-indicators. Each factor was considered separately in determining the category of care, not only to assess a patient's requirements for nursing care, but also to determine his placement in that area of the hospital most appropriately suited to his needs. In addition to the references cited, other sources on the early development of PPC include Lockward and others (1960), Griffith (1964), Gordon and others (1966), Weeks and Griffith (1964), and Preston and others (1964). The difference between patient classification instruments designed for progressive patient care and those designed for nurse staffing should be noted. The former consider the entire spectrum of patient requirements for services, while the latter relate only to requirements for nursing services. Although the patient classification for PPC may be useful for gross estimates of nursing personnel, the instruments are frequently insensitive to the precise nursing resources necessary for day-to-day allocation. One of the basic problems is that the PPC instruments focus primarily on severity of illness, which does not always correlate well with nursing involvement.

A major methodological study aimed at obtaining agreement between nurses and physicians using different checklists, highlighted this problem (White, Quade, and White 1967). Lack of agreement was found between nurses who used a multicriteria checklist and physicians who used a prototype evaluation, both of which allocated patients to self-care, intermediate care, and intensive care. The influence of specific variables was tested, and only when the nurses' checklist had been reduced to five nursing criteria, all of which related to physical

care, was agreement reached. Although the new criteria resulted in an improved system for classifying patients into the three categories of care, the lack of criteria relating to emotional and teaching requirements diminishes its applicability for nurse staffing.

Classification Redefined for Nursing

Developments in the field of patient classification assumed a much clearer focus and accelerated much more rapidly as a result of the investigations conducted at the Johns Hopkins Hospital, Baltimore, Md. In 1956, the hospital formed the Operations Research Division which launched, as one of its first studies, the development of an optimal organization of staff, equipment, and procedures for nursing units. As part of the investigation, an inpatient study was conducted to identify elements of patient care and to determine the approximate times to perform them. To ensure a representative sample, it was necessary to establish criteria for the selection of patients to be observed. The criteria selected included the extent of the patients' mobility and emotional disturbance, their level of consciousness, the presence of inadequate vision, and the need for isolation. Patients were grouped according to their possession of these criteria. Then, an equal number of patients from each group were selected for observation. During the data collection phase, it was observed that the criteria being used to group the patients were imprecise and there were large variations in the care received in each group.

At this point, the now well-known classification system was developed. The nature of the data collection (continuous observation of direct care provided to patients) permitted the identification of the elements of care which could be useful in isolating patients into discrete categories (Connor 1960, Conner and others 1961, Connor 1961A). The format of the classification instrument closely followed the one developed at the Manchester Memorial Hospital but went beyond patient assignment to provide, for the first time, an estimate of the nursing time requirements of patients. Although the three-category instrument contained a list of factors,it was identified as a prototype evaluation form and contained a variety of information relating to the patient's degree of self-sufficiency as shown in Figure 1, page 25. When the check list was completed for each patient on a unit, one of the three categories was determined by applying a set of specific criteria as decision rules. The instrument was designed so that the nurses could use it with minimum time and effort. It took less than 5 minutes to collect the information on a 29-bed ward once the patients' names had been completed. The supervisor could then assign the patients to the appropriate category in about 2 minutes.

Check if YES

CLASSIFICATION OF PATIENTS

THE JOHNS HOPKINS HOSPITAL

CLINIC _____

WARD _____

DATE _____

					AMBULATORY		UP IN CHAIR		BATHING				FEEDING				MISCELLANEOUS						EMOTIONALLY DISTURBED		SPEC. OF NEC.
									IN BATHRM.		AT BEDSIDE														
	SEX	AGE	OB	AN	SELF	WITH ASS'T.	SELF	WITH ASS'T.	SELF	ASS'T. NEC.	PARTIAL SELF	COMPLETE ASS'T.	SELF	REQUIRES FOOD CUT	IV	COMPLETE ASS'T.	INCONTINENT	SUCTION	O2	ISOLAT.	UNCONSCIOUS	VISION INADEQUATE	SLIGHT	MARKED	

The criteria used in the classification were mostly based on observable physical characteristics which presented little opportuniy for variability in interpretation among nurses. A later check of the reliability of the instrument in three hospitals revealed a reliability coefficient of .92 (Levine 1960).

A second work measurement study involved the continuous observation of patients after the classification system was in operation, and provided evidence of validation. The patient classification system permitted care-times to be associated with the defined patient classes. This finding led to the computation of a direct care workload. The number of patients in each class was multiplied by the average care-time associated with each class, and the products were added to provide an estimate of total hours of direct care required. Having achieved a quantification of the nursing workload associated with direct patient care, further study was continued to determine the relationship between this and the total workload. This investigation revealed that variations in the direct patient care work load did result in variations in the total workload. A staffing standard based on a fixed number of nursing-hours per patient-day was not the best choice for determining a staffing pattern. A patient-day could be either a class I, class II, or class III day, and the care needs of each differed greatly.

The behavior of the class III patients was analyzed further. The number of class III patients on the wards was found to approximate a Poisson distribution, and their lengths of stay could be approximated by a negative exponential distribution (Flagle 1960). The implication of this finding is that a large variation in the basic nursing task must be expected, and some action should be taken to address this variation. The alternatives to a fixed staffing allocation system were presented as being progressive patient care, selective admissions, and controlled variable staffing. The latter was deemed the most desirable course for the study hospital at that time and was later expanded to provide a staffing mechanism for the hospital.

Young (1962) worked out a daily staffing pattern using the direct care index developed by Connor and adding a constant for indirect care. Based on the daily mix of patients in each of the care categories, the total workload for a 24 - hour period could be determined. It was suggested that nursing maintain a basic or fixed staff on each unit to satisfy the daily minimum demand. Additional staff could then be assigned to each floor on the basis of the relative peaks in demand. This was referred to as controlled variable staffing. The total staff on each nursing unit varies according to the total care demands of the patients, but control is maintained over the amount of supplementary staff assigned to each unit (Wolfe and Young 1965).

Although controlled variable staffing was inextricably related to the total workload required, as well as to the total

nursing hours available, the role of professional nursing judgment was not ignored. It was recognized that the computations were based on coefficients that reflected averages and at any one time there could be patients whose care needs deviated significantly from these. This meant that the actual assignment of personnel to the high-workload floors and the removal of personnel from the low-workload floors should continue to be based to some extent on the experience and judgment of the nursing supervisor. The use of a multiple assignment method of estimating the quantitative and qualitative nursing needs to improve the applicability of controlled variable staffing was also suggested. The multiple assignment model considered the complexity of the tasks involved in patient care and the levels of nursing personnel available for care. With the aid of a computer, the optimal staffing complement to meet the specific demand could be determined (Wolfe and Young 1965A). This method, however, was never implemented in the study hospital.

The patient classification system and controlled variable staffing were implemented throughout the hospital, except for pediatrics and psychiatry, shortly after its development and were in effect for about 6 years (Young 1962). Although the system was never fully evaluated under formal experimental conditions, there was substantial evidence that staffing problems had been alleviated and that patient care had improved. However, the system was eventually discontinued for a variety of reasons: major changes in nursing practices from those that existed during the development stages of the system, the retirement of several key nursing leaders who motivated and controlled the system, and finally (and of major importance) difficulties in obtaining the nursing personnel required to maintain the basic and variable staff components. Recently, the hospital has once again shown an interest in this approach to nurse staffing. Direct and indirect care nursing studies have been conducted in the department of surgery, and a classification system based on the Saskatchewan method has been implemented.

A number of significant findings were revealed in the Johns Hopkins study. First was the relationship between workload and census. The investigators were able to demonstrate that patient care was not a function of gross census alone, but rather of the number of patients in each category of care present on the ward. Second, the variation in demand for nursing staff was found to be large relative to the average demand. Third, the variation in demand for nursing staff was independent from ward to ward. Fourth, the main determinant of nursing workload was the number of class III or intensive care patients.

The increased pressures of work on nurses in England was also an incentive for investigations in that country relating to the measurement of nursing care (Oxford Regional Hospital Board 1967). A three-category dependency scale modeled after

the Johns Hopkins classification was developed, and the amount of basic and technical nursing care received by the categorized patients was measured by continuous observation. The nursing care received by the patients in the three care groups was in the ratio of 1 to 2 to 5, the same ratio that was found at Johns Hopkins. The Oxford studies also reported that the workload index was much more variable than the number of occupied beds, and it could be reduced but not eliminated by organizing beds into larger organizational units. Again, these findings corroborated those at Johns Hopkins.

As an alternative analysis to average care-times, the investigators used regression analysis to provide individual scores for each of the individual items on the classification form. When all items were used separately, rather than analyzed in terms of three care groups, a fourfold increase in the efficiency of predicting the total amount of nursing care-time was found. The analysis also revealed that incontinence in a patient was, by itself, an effective evaluator of the amount of nursing care required. According to Baar, Moores, and Rhys-Hearn (1973) the Oxford scheme is the one most frequently adopted in the United Kingdom, and modifications have been introduced to meet local circumstances.

A review of the historical developments through the mid-sixties reveals three distinct phases in the development of patient classification systems in nursing. The first phase represented the period devoted to the search for the appropriate proportion of professional to nonprofessional nursing staff, a search that became critical during a period of nursing shortage and a heavy influx of many new levels of nursing personnel. The second phase assumed a broader context to involve all members of the health care team. Rising costs and hospital bed shortages stimulated a conscious effort to ensure the proper use of resources. The concept and procedures of progressive patient care offered some assurance in placing patients in the appropriate facilities. The third phase once again focused on nursing. At first the concern was not to find an alternative to the standard hours of care which had become almost universal, but to effect improvements and efficiencies in the delivery of care so that nurses could complete their work within the standard number of hours. The industrial engineering techniques used did indeed lead to improvements, but ultimately led to the realization that the standard hours of care based on census were not necessarily relevant. A more detailed look at patient-days led to the categorization of patients according to their anticipated requirements for nursing care.

For further details and examples of some of the historical developments, there are a number of excellent sources. The most comprehensive is a review and critique of the literature relating to staffing methodologies (Aydelotte 1973). Methodological approaches and problems are discussed by: Abdellah and Levine (1965), Baar and others (1973), and King (1975).

A discussion of the literature in relation to manpower productivity can be found in Levine (1975) and Jelinek and Dennis (1976). The place of patient classification within the context of information systems is discussed by Gue and Freeman (1975). Finally, reviews of the contribution of operations research and industrial engineering in the health care field provide references to many patient classification systems: (Stimson and Stimson 1972, Wandel and Hershey 1974, Flagle 1975, and Young 1975).

Following the developments at the Johns Hopkins Hospital and the Oxford Regional Hospital Board, a proliferation of studies began. These originated from a variety of sources, but the major impetus came from multihospital management engineering programs. The California Commission for Administrative Services in Hospitals (CASH) was one of the first to concentrate on nurse staffing requirements. Its approach consisted of the establishment of standard times for a large number of nursing care activities and procedures (CASH 1967). The CASH approach, as used today, is described on page 30. A number of other management engineering programs also became involved in nursing standards. They include the Hospital Associations of Massachusetts, Michigan, Tennessee, Texas, Virginia, and Western New York. An excellent review of all of these programs has been prepared by Ludwig (1971).

Individual hospitals and consulting firms also began to experiment with these concepts. All were seeking a rational approach to the frequently asked question: "How much staff do we need?" Many nurses were exposed to the Johns Hopkins classification and other systems, and almost without exception, the instruments were initially rejected. Since the individual requirements of patients varied greatly, it seemed highly improbable that patients could or should be slotted into just a few groups. Moreover, the classification instruments appeared to ignore the components of emotional and psychological support and the educational requirements of patients. After some experimentation, however, the concept of classification gained acceptance. Users recognized that although not always explicitly addressed in the instruments, patients' requirements for emotional support and teaching were not ignored. The next section describes a variety of patient classification systems currently in use and despite refinements, the systems depart little from the designs introduced in the early 1960's.

IV. EXAMPLES OF PATIENT CLASSIFICATION SYSTEMS

The following contains a brief description and illustration of a variety of patient classification systems. Mostly, those selected for illustration from the hundreds available were chosen because they represent a diverse range of the approaches available and provide examples of systems that have been successfully implemented. Moreover, they are characterized by extensive development stages and have frequently served as models for many other implemented classification systems. No attempt has been made to critique the methodologies presented, and the reader is encouraged to review the "Bibliographic References" section for additional information. A number of bibliographical references which describe the systems are provided, but in some cases, the early publications represent initial stages in their development and may describe the systems in a more primitive stage than their current format. The first set of illustrations relate primarily to medical and surgical inpatient settings. This is followed by systems specifically designed for pediatrics, psychiatry, and ICU. Finally, a section on long-term care deals with the developments in this area.

Medical-Surgical Classification Systems

The major effort in the development of patient classification systems has understandably been in the area of medical and surgical patient care units. The systems have been readily transferred to many related speciality units such as orthopedics and neurology, but their appropriateness for pediatrics and psychiatry is limited. Although examples and illustrations are provided in this monograph, they represent insufficient information for implementation.

Commission for Administrative Services in Hospitals (CASH)

CASH began its involvement in 1963 as an outgrowth of the Hospital Council and Blue Cross of Southern California to aid administrators in improving the cost effectiveness of hospital services. One of their first major efforts involved the establishment of time standards for a wide variety of nursing care procedures. With information pertaining to the frequency of these procedures, standard care-hours per shift were established. A four-category prototype evaluation was developed, and the average hours per patient-day were then distributed among the four care groups. References relating to these earlier studies include: Edgecumbe (1965 and 1966), McCartney and others (1970), Georgette (1970), and Des Ormeaux (1977).

The CASH approach to nurse staffing has undergone numerous changes, and the present procedure differs considerably from the earlier work, although a patient assessment is made, the result does not culminate in a specific category of care. The assessment form, "Patient Care Requirement Ranges," itemizes 12 areas of care, ranging from eating and grooming to special treatments and monitoring, and provides 4 ranges, indicating the degree of nursing involvement for each area of care (Figure 2, page 32). "Nursing Time Rating Sheets" for each shift (Figure 3, page 33) are used to quantify the nursing time commitment to each patient. The column headings on these sheets match the 12 areas of care, and the 4 numbers in each box are the point values which are applicable to the 4 ranges of care. The applicable number in each box is circled for each patient and then added to provide the total variable points. The coefficients for the four ranges in each area of care are determined from previously developed standard times for procedures.

The assessment of patients' requirements for nursing care closely follows the factor evaluation method, except that the ratings on the individual elements are not combined to provide an overall category of care. In addition to the variable time, a constant coefficient is determined to quantify the constant activities which nursing will routinely perform for each patient. Using the guide "Constant Determination" (Figure 4, page 34), the time values entered opposite each task definition relate to the hours of nursing time required for each patient on each shift. For the missing time values, each hospital must determine the frequency of performance of the task, which is then multiplied by the corresponding standard time. When all of the constant values have been entered, the columns are totaled, and the sums are entered opposite "Total Constant." The total constants are then converted to equivalent points by multiplying by 10. The variables, plus the constant points, are added for each patient to provide the total number of points for which staffing must be provided. Each point is equivalent to 0.1 hour, and therefore each staff member who works 8 hours can handle 80 points. In this manner, the nursing staff is determined (CASH 1977).

Community Systems Foundation Limited (CSF Ltd.)

Community Systems Foundation has been involved with patient classification systems in nursing for a number of years and like other consulting groups in the field of nurse productivity has undergone numerous changes in the approaches applied. The present four-category patient classification instrument contains 25 characteristics or indicators of nursing involvement. The selection of indicators may be tailored to each institution and nursing unit (Figure 5, page 35). A guide to the interpretation and selection of the appropriate determinants, entitled "Medical-Surgical Patient Classification System" (Figure 6, page 36), accompanies the factor evaluation

FIGURE 2 **PATIENT CARE REQUIREMENT RANGES**

AREA of CARE	RANGE 1	RANGE 2	RANGE 3	RANGE 4
Eating	Feed self or needs minimal assistance	Needs some help or encouragement. Cut and assist	Spoon-feed - is able to chew and swallow	Spoon-feed - difficulty chewing and swallowing. Tube feed
Grooming and Cleanliness	Almost entirely self-sufficient	Needs some help with bathing, oral hygiene, hair combing, etc.	Unable to do much for self	Complete bed bath; Oral hygiene; Comb Hair; Skin care; Shave patient
Excretion	Up and to bathroom alone or with minimal assistance	Needs some help getting up to bathroom or using urinal	In bed needing bed pan or urinal placed and removed. May be able to partially turn or lift self. Incontinent less than twice per shift.	Incontinent, frequent bed changes (more than 2). Cannot turn self. Needs 2 people to assist Peri care.
Comfort and Turning	Self sufficient or needs minimal assistance	Needs help to turn or reposition	Completely dependent but can be turned by one person	Log Roll, Foster, Stryker, etc.
Respiratory Aids (Count only if done by Nursing)	Minimal assistance	One per shift of any of the following: I. T. trtmt. by Nursing, Continuous Chest Tube suction, PRN suction, Humidifier, Tent, Cont. O_2, Cough & D. B. 2/shift, Post Drain. 2/shift, Resp. Ther. Proc. Obs. by Nursing	Any combination of 2 - 4 Range 2 procedures or Continuous Respiratory observation by Nursing or Trach Care	5 or more Range 2 procedures or Continuous Respiratory observation by Nursing or Trach Wean
Teaching (Patient or Family)	Routine Follow - up Teaching	5 - 10 minutes/shift	10 - 30 minutes/shift (Count only if recorded in Patient's chart)	More than 30 minutes/shift
Special Trips to Provide Emotional Support	Special trips requiring less than 10 minutes/shift	Special trips requiring 10 - 20 minutes/shift (Count only if recorded in Patient's Chart)	Special trips requiring 20 - 60 minutes/shift	Special trips requiring more than 60 min/shift
Medications	Routine Meds 2/shift or less	3 - 5 Meds/shift Excluding I. V.'s	6 - 8 Meds/shift Excluding I. V.'s	9 or more Meds/shift Excluding I. V.'s
I. V.'s and Transfusions	Not required, or done by personnel not a part of the unit	Observe, change bottles, Piggyback Routine Push	Start I. V. or continuous I. V. or Transfusion 1/shift or Push over 12 minutes	More than 1 transfusion per shift
Treatments	1 Point from any of the following. Point Value = 1 Each Simple supervised Ambul, Routine Dressing, Simple Test Procedure, Specimen collection, K-Pads, Ace Bandage, Routine Skin Care, Oral hygiene, I&O 4/shift, Glove or Glove and Mask Isolation, Tube or Wound Irrigation, Hot or Cold Packs, Pericare, maintain traction or Pressure Pad, etc., or other procedures requiring 10 minutes or less	2 - 3 Points from Ranges 1 and 2. Point Value = 2 Each: Vital signs q4h (Count as two Range 2's if more frequent) Catheterization, Enema, Bladder or Throat Irrig, Pressure Pad Start, Amb/Dangle/Exer. with assist, Sitz Bath, Art. Blood Gas, Bed Appliance Apply, Blood Pressure: Supine and Standing, Colost or Ileost. Care, complicated Dressing Change, Gastro-Intest Suction, Shampoo, Sponge Cooling, Surgery Prep, Traction Setup, Weigh Bed Scales, Isolation requiring gowning, etc., less than 4/shift (Count as two Range 2's if more than 4/shift) or other procedures requiring more than 10 minutes.	4 - 8 Points from Ranges 1 and 2. Procedures in Range 1 = 1 Point Procedures in Range 2 = 2 Points Examples of Range Determination: 1) Clove Isolation = 1 Routine Dressing Change = 1 Catheterization = 2 Total Points 4 = Range 3 2) Vital Signs q4h = 2 Specimen Collection = 1 Total Points 3 = Range 2 3) Pericare = 1 Vital Signs q2h = 4 (2 Range 2's) Weigh-Bed Scales = 2 Isolation Gowning 6/shift = 4 Total Points 11 = Range 4 If Total Points exceed 14, rate as Range 4 and subtract 14 from Total Points, multiply answer by 6 minutes, determine appropriate "Spec. Trtmts." Range below; Example: 17 pts. -14 = 3 x 6 = 18 18 minutes = Range 2 "Special Treatments"	9 - 14 Points from Ranges 1 and 2.
Special Treatments	Not Required	Doctor assist, etc, 10-30 minutes/assist (Do not count Doctor's Rounds)	30 - 60 minutes/shift	More than 60 minutes per shift
Monitor	Not Required	Intermittent or Telemetry or Pressure Monitor or Rhythm Strips	Continuous Coronary monitor or Vaso-Pressor patient	Continuous Coronary monitor & Vaso-Pressor or Pressure Monitors

GENERAL INSTRUCTIONS: Do not consider procedures performed by personnel not assigned to unit; on questionable Range determinations, rate some up, rate some down; evaluate each patient on actual care requirement for shift being evaluated; special treatments includes biopsies, treatment room doctor assist, Swan Ganz, etc., and excess as noted under treatments. If patient is 1:1 instead of profiling by area of care, record 80 Points as Total Variable Points.

COMMISSION FOR ADMINISTRATIVE SERVICES IN HOSPITALS Form No. 112

Unit _____ Date _____ Shift DAY Transports by Nursing _____ 3.76

Rm/ Bed	Eat	Gr & Cl	Exc.	C & T	Resp. Aids	Teach	Spec. Trip	Meds	I. V.	Trmt	Spec. Trmt	Mon.				Var. Pts.	Con. Pts.	Total Points
	0 2 4 6	0 2 4 6	0 2 3 6	0 1 2 4	0 2 5 10	0 1 3 5	0 2 5 12	0 1 2 3	0 1 3 5	0 2 5 10	0 3 7 12	0 6 14 22						

FIGURE 4

NURSING R. V. U.

CONSTANTS DETERMINATION

TASK	HOURS of CARE REQUIRED DAY	EVE	NITE
AM Care	.083	-0-	-0-
Bed Change	.067	-0-	-0-
Call Lights	.090	.090	.061
Census Count .060 .060 .060 ÷ _____ Avg. Census	( )	( )	( )
HS Care	-0-	.038	-0-
Linen Dispose	.014	-0-	-0-
Narcotics Count, .250 .250 .250 ÷ _____ Avg. Census	( )	( )	( )
Paperwork	.290	.190	.103
Premeal Care	.062	.031	-0-
Report-Personnel	.022	.017	.006
Rounds-Supervisor	.004	.004	.004
Rounds-Doctor	.014	.015	.001
Rounds-Inspection	.006	.006	.076
Fresh Water (.012/Occ.)	( )	( )	( )
Routine TPR (.030/Occ.)	( )	( )	( )
Pass/Pick Up Trays (.082 - .041 - 0)	( )	( )	( )
Pat. Transp. (.167 x freq ÷ census) Typical .020 .005 .000	( )	( )	( )
Transfers (.250 x freq + census) Typical .003 .001 .001	( )	( )	( )
Other - Describe			
_____	( )	( )	( )
_____	( )	( )	( )
_____	( )	( )	( )
_____	( )	( )	( )
TOTAL CONSTANT	_____	_____	_____
EQUIV. RVU POINTS	_____	_____	_____

Commission for Administrative Services in Hospitals

Form No. 412-30

PATIENT CLASSIFICATION SHEET

UNIT: Med.-Surg.
DATE: _____ TIME _____ a.m. p.m.
BY: _____ R.N.

ROOM AND BED NOS.

1	Self bathe or feed. Ambulatory.
2	Simple treatments and/or medications.
3	Off unit for procedures (stop here).
4	Private duty nurse (stop here).
5	Assist to bathe, feed or ambulate.
6	Oral or pharyngeal suctioning.
7	Parenteral fluids.
8	Above average emotional needs.
9	Pt/relatives required additional teaching/support/supervision exceeding usual
10	Vital signs more than Q.4h.
11	Intermittant O_2 therapy involving nursing.
12	Extensive diagnostic studies/treatments/procedures.
13	Assist with hearing, speech, or sight.
14	Surgery--returned.
15	Admit--during shift of admission.
16	Isolation--complete.
17	Complete bed bath and assist/complete feed for patient.
18	Frequent deep suctioning.
19	Complex--parenteral fluids.
20	Unconscious.
21	Marked emotional needs.
22	Telemetry.
23	Vital signs every hr or more frequently.
24	Complex suctioning/irrigating routines.
25	1:1 Nursing
	FOR CSF USE ONLY

FIGURE 5

FIGURE 6

MEDICAL-SURGICAL
PATIENT CLASSIFICATION SYSTEMS

INDICATORS	DECISION RULES
1) Self bathe or feed. Ambulatory.	1) Patient is "up ad lib" and requires no assistance in bathing other than usual back care, back rub.
2) Simple treatments and/or medications.	2) Patient has only mild symptoms which may require treatment or medications--Examples: Hot Packs, Aqua K, Catheter Care, simple procedures.
3) Off Unit for procedures (stop here).	3) Check if patient is in the OR, or off the unit for another procedure, and has been off for the majority of the shift; stop classification at this indicator. If patient is scheduled, but hasn't been taken yet, check indicators applicable at the time.
4) Private duty nurse (stop here).	4) Check for patient with private duty nurse requiring support from staff nurses for some cares, information or relief for breaks. Check other indicators if a sitter is present.
5) Assist to bathe, feed, or ambulate.	5) Check for patients who require assistance with bathing (self c help), feeding, or ambulation.
6) Oral or pharngeal suctioning.	6) Includes patients with NG tubes connected to suction, and other tubes connected to power suction.
7) Parenteral fluids.	7) Check if the patient has an IV (TKO, or intermittant), or if patient is receiving tube feedings.
8) Above average emotional needs.	8) Check for patients who are more than normally confused, anxious, depressed, etc., and/or who exhibits deviation from his or her usual pattern of behavior.
9) Patient/relatives required additional teaching, support, or supervision exceeding the usual.	9) Check if patient or relatives' behavior manifests itself in the need for additional nursing involvement beyond that usually expected.

FIGURE 6 (continued)

INDICATORS	DECISION RULES
10) Vital signs more than Q.4h.	10) Check for any patient with vital signs (blood pressure, TPR, neuro checks) required more than Q.4h.
11) Intermittant O_2 Therapy involving Nursing.	11) Chest pain, etc.
12) Extensive diagnostic studies, treatments or procedures.	12) Includes patients who require preparation for and/or require observation following diagnostic studies, treatments, or procedures (i.e., arteriograms, bowel preps, myelograms, epidural blocks, etc.)
13) Assist with hearing, speech, or sight.	13) Check for patients with major hearing, speech, or vision impairments, or foreign language speaking patients.
14) Surgery--returned.	14) Check for patients who have had surgery today and have returned to unit. Check other indicators pertaining to patient at the time.
15) Admit--during shift of admission.	15) Check for patients admitted or transferred to the unit during the shift. Check other indicators pertaining to the patient.
16) Isolation--complete.	16) Check for complete isolation requiring gowns, and for patients on protective isolation.
17) Complete bed bath and assist/ complete feed for patient.	17) Check to indicate that patient requires a complete bed bath, and requires assistance or complete support for feeding.
18) Frequent deep suctioning.	18) Check for patients who need nasal, pharyngeal, or endotracheal suctioning, or tracheostomy at least every two hours.

FIGURE 6 (continued)

INDICATORS	DECISION RULES
19) Complex-parenteral fluids.	19) Check if patient has continuous fluids, or is on maintenance and replacement, rate controllers (i.e., IVAC's), hyperalimentation, q.i.d. or greater piggyback IV medications, or varying rates based upon symptoms or condition. Includes blood or blood products.
20) Unconscious.	20) Check for comatose or unconscious patients. Would also include non-reactive patient following surgery, extensive diagnostic procedure, or ET during shift of treatment.
21) Marked emotional needs.	21) Check if patient is seriously confused, anxious, depressed, etc., or exhibits significant deviation from his/her usual behavior pattern. This may include patients in the locked rooms.
22) Telemetry.	22) Check for patient on telemetry.
23) Vital signs every hour or more frequently.	23) Check if vital signs (blood pressure, TPR, or neuro checks) are ordered every hour or more frequently.
24) Complex suctioning or irrigating routines.	24) This indicator refers to suction tubes which require stripping every fifteen minutes to one hour. Suction or irrigation routines such as: sumps, Murphy drip, or complex wound care.
25) 1:1 Nursing.	25) Check if a 1:1 assignment has been made using a member of the hospital's nursing staff for the entire shift.

FIGURE 6 (continued)

Medical/Surgical

Patients are classified according to the following schedule:

- Indicator #25 checked = Category IV
- Any indicator above #17 and less than #25 checked = Category III
- Any indicator above #5 and less than #17 checked = Category II
- Only indicators 1-4 checked = Category I

to ensure consistent interpretation. Classification is performed by the head nurse, charge nurse, or team leaders on each shift predictably for subsequent shifts.

The determination of the appropriate category of care differs from service to service, with specific decision rules for the major specialties. For the medical/surgical units, the following schedule is applied:

Indicator #25 checked=Category IV
Any indicator above #17 and less than #25 checked=
Category III
Any indicator above #5 and less than #17 checked=
Category II
Only indicators 1-4 checked=Category I

A separate list of patient characteristics, interpretation guide, and decision rules has been developed for pediatrics, ICU/CCU, psychiatry, and (recently) extended care. The pediatric classification contains four categories of care, as does the instrument for extended care. In ICU/CCU, five categories of care have been identified, and the system for psychiatry uses six categories of care, the sixth referring to outpatient care.

Both direct and indirect nursing care studies are used to determine the coefficients applicable to each category of care and the required number of nursing staff. To determine direct nursing care, a profile of the 100 most frequently performed procedures on the unit is obtained. For each patient and for each hour of the day, the nurses on the ward record the frequency with which the activities are performed in each category of care. Standard times are then assigned to each activity and when multiplied by the frequency and totaled, the total direct care-time requirements for each patient, provided by each level of nursing personnel, are obtained. Work sampling is used to determine the nondirect care-times per hour of day or per level of nursing personnel.

The results of the two studies provide the average care times per category of patient and per level of personnel. Staffing patterns can then be determined using the average number of patients in each category multiplied by the care coefficients. Comparing the hours required with the known hours available permits the nursing department to assign nursing float personnel and to exchange personnel between units. Using a computerized nurse management information system, a variety of reports are produced to facilitate monitoring staff utilization and long-range planning (Gabbert and Parkinson 1974, Gabbert and others 1975, Community Systems Foundation, Ltd. 1977).

Medicus Corporation

The Medicus Corporation, in cooperation with Rush Presbyterian-St.Luke's Medical Center in Chicago, Ill., developed a four-category factor evaluation patient classification system (Figure 7, page 42). Thirty-two indicators considered significant in defining nursing workload and in differentiating one category of care from another are identified on this form. These range from physical needs to emotional and teaching needs. Each of the indicators has an associated point value or weight, arrived at through work sampling, time study analysis, consultation, and acceptance by the nursing service department.

The total point count for each patient is determined by summing the point values of the indicators checked. The total points provide the range for the four categories of patient care: 0 to 8 pts. = type 1 (minimal care), 9 to 16 pts. = type 2, 17 to 40 pts. = type 3, and more than 41 pts. = type 4. This workload index is then translated into required nursing hours per patient. Again, boundaries were established to reflect the hours of care required for each type or category of patient. This has generally been accomplished by determining the total average care-hours deemed desirable and permissible within budget constraints and then apportioning the total to each of the four care categories over each of the three shifts. Both the weights and the average care-times reflect direct and indirect nursing care activities.

On the day shift, the team leader, primary nurse, or responsible nurse completes the classification for her patients by using a set of definitions for each of the "Patient Condition Indicators" (Figure 8, page 43). Only major changes and updates are required by the evening and night shift nurses. A predictive mode is used to enable adjustments to staffing before each shift. The number of patients in each category is relayed to a central nursing office, where necessary changes in the allocation of nursing staff for succeeding shifts are made. The system has been modified to apply to pediatrics. The Medicus Corporation also offers the patient classification system as part of an overall Personnel Allocation and Scheduling System which involves workload monitoring, personnel scheduling, and allocation and management reporting. Selected references which discuss the Medicus system may be found in Jelinek and others (1973), Brya and Pierce (1974), Jelinek and others (1974), and Plummer (1976).

Saskatchewan Hospital Systems Study Group (HSSG)

The Hospital Systems Study Group and the University Hospital of Saskatoon, Saskatchewan, Canada, developed a patient classification system during a 5-year study of hospital organization (Holmlund 1967, Sjoberg and Bicknell 1968). The aim

FIGURE 7

Rush Presbyterian-St. Lukes Medical Center (Medicus)

Floor_____

Date_____

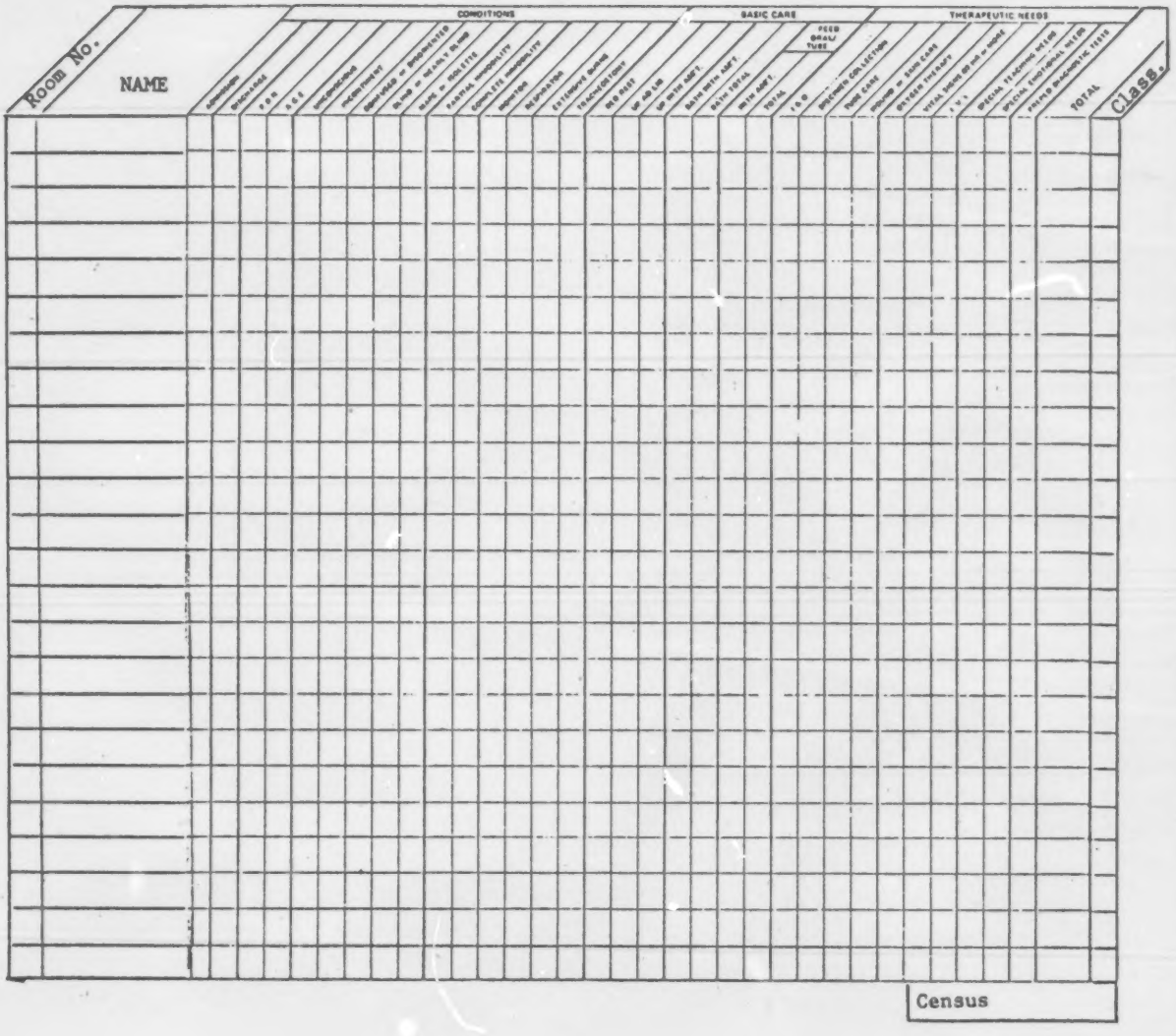


FIGURE 8

PATIENT CONDITION INDICATORS

Admission or Transfer - Place check mark (✓), if admission or transfer is planned for that day.

Discharge - Place check mark (✓) in addition to other conditions, if discharge is expected to occur that day.

Age - Self-explanatory.

PDN - Place check mark (✓), if patient is expected to have a private duty nurse at least 2 out of 3 shifts.

Unconscious - If this condition has a check mark (✓), patient cannot be confused or disorientated. If patient is blind, it would have no useful meaning, if he is also unconscious. The patient's basic care could not be listed as up ad lib or up with assistance. Teaching needs would also be erroneous in this situation.

Incontinent - Refers to patient actively incontinent: does not need to be checked, if patient has indwelling catheter.

Confused or Disoriented - Patient cannot be unconscious.

Blind or Nearly Blind - Place check mark (✓), if patient is relying on nursing for needs due to blindness. This would also be checked on patient with eye patches, e.g., post-op cataract.

MAPC-Isolette - Refers to patient in isolation.

Partial Immobility - This has no relationship to the patient's basic care, e.g., a patient on bedrest may be fully able to use the bedpan, turn, reach, etc. with no assistance from nursing while anotner patient may be up with assistance, but require the assistance of 3-4 nursing personnel to move from the bed to the chair.

Complete Immobility - See explanation above. This refers to an even greater degree of immobility.

Monitor - On monitor or being continuously monitored.

Respirator - Self-explanatory.

Extensive Burns - Self-explanatory.

Trach - Place check mark (✓) for any patient who has a tracheostomy. Under therapeutic needs one would also check tube care, if this is being done by nursing.

Bedrest - Self-explanatory. Up ad lib or up with assistance cannot be checked, if bedrest is checked.

Up Ad Lib - Self-explanatory. Bedrest or up with assistance cannot be checked, if up ad lib is checked.

Up With Assistance - Self-explanatory. Bedrest or up ad lib cannot be checked, if up with assistance is checked.

Bath With Assistance - Self-explanatory.

Bath Total - Self-explanatory.

Oral or Tube Feeding With Assistance - Self-explanatory.

Oral or Tube Feeding Total - Self-explanatory.

THERAPEUTIC NEEDS

Intake and Output - Self-explanatory.

Specimen Collection - Self-explanatory.

Tube Care - Place check mark (✓), if patient needs assistance with any tubes, e.g., suction for trach, cleaning trach tube, irrigating and aspirating nasogastric tube, or irrigating foley catheters.

Wound or Skin Care - Place check mark (✓), if patient has dressings, packs, etc. Skin care will also include those patients with decubiti.

Oxygen Therapy - Place check mark (✓), if patient receives any assistance from nursing for oxygen therapy.

Vital Signs - Place check mark (✓), if patient's vital signs are monitored more often than routinely. Vital signs should include TPR, B/P, NeuroSigns, Extremity Pulses, etc.

Intravenous - Self-explanatory.

Special Teaching Needs - Place check mark (✓), if patient will receive instruction, e.g., diabetic teaching, pre-op teaching.

Special Emotional Needs - Place a check mark (✓) for those patients who require a greater emotional support than would be expected for average patient on unit.

Prepared Diagnostic Tests - Place a check mark (✓), if tests require preparation from nursing, e.g., cardiac catherization.

of the research was to reorient hospital organization structure into direct contact with the patients and their needs. The importance of an instrument to assess patients° needs was apparent early. Five major components of care were identified as critical in determining the care requirements of patients: "personal care," "feeding," "observation," "ambulation," and "other," Each of these components was further refined into 13 critical determinants which compose the "Patient Classification Instrument" (Figure 9, page 46). This classification system represents a four-category factor evaluation of patients° needs for nursing care, with the critical indicators appropriate to each patient being checked on the form. A set of guidelines to assist the nurse in selecting the appropriate determinants has been developed, and from the definitions supplied, the emotional and teaching needs of patients, as well as their physical care needs, have been apparently considered (Figure 10, page 47).

Extensive, continuous observations of direct care delineated four distinct categories of care in terms of nursing care-time. These range from Category I (Minimal Care) to Category IV (Intense Care). Based on the combination of critical indicators selected, the patient is assigned to one of the four categories. A set of decision rules, "Guidelines for Interpreting Categories" (Figure 11, page 50), assists in the assignment of the appropriate category. Again, continuous observations were conducted on several occasions and in different care settings to validate the assignment of indicators to care categories (Sjoberg and Bicknell 1969, Sjoberg and others 1971, and Giovannetti and McKague 1973).

For each of the four categories of care and for each 8 hour shift, average minutes of direct care are determined from direct patient care studies. These average care-times are then converted to ratios, and when multiplied by the number of patients in each category, provide an index of the workload. To determine the amount of time per shift that each nurse has available to provide direct care, indirect activity studies of nursing personnel were conducted. Conversion tables and graphs are used to relate the workload index to the number of personnel required. A manual has been prepared delineating the steps involved and explaining the concepts of staffing by this method (Giovannetti and McKague 1973).

The usual procedure is for the charge nurse, in consultation with her staff, to classify all patients early on each shift. This is done in a predictive manner to estimate the staffing needs for succeeding shifts. The system is first used to determine the appropriate baseline staff which should be apportioned to each nursing unit. To cope with fluctuations in the shift-to-shift requirements for staff, personnel may be transferred from one nursing unit to another, and/or a float pool may be used. Although the system was developed for medical and surgical nursing units, it has been used successfully

FIGURE 9

DAILY PATIENT CLASSIFICATION

WARD _____

DATE _____

ROOM & BED	NAME OF PATIENT	Personal Care			Feeding		Observation			Ambulation			Other		Total			CATEGORY	Comments
		Complete Bath Basin & Assistance C	Basin or Tub B	Fed or N.P.O. A	Partial Help C		Constant - QIH B	Q2 - Q4H A	Q4H or Less C	Bed or Chair & Position & Support B	Up & Assistance or Bedrest, B.R.P. A	Up and About C	Incontinence C	Pre-op C	Minimal A	Average B	Above Average & Intense C		

FIGURE 10

GUIDELINES TO INTERPRETATION OF DETERMINERS

i) PERSONAL CARE

Complete Bath:

Patient is dependent upon the nurse for his complete bath. It could be that the bed bath is given by the nurse or that the patient requires continual coaching by the nurse during the bath, as in rehabilitation. It could also be a tub bath or sling bath if the patient requires continuing assistance, or if more than one person is needed for assistance (for example, a burn bath). One must consider age, general condition, tubes, applicances, etc. which inhibit the patients' ability to be independent.

Basin or Tub with Assistance:

Patient requires assistance with washing back and legs. Patient needs bath equipment set up, partial assistance and periodic supervision and coaching. Patient may only need help to get in and out of the tub.

Basin or Tub:

Patient takes bath independently; back may be washed by nurse.

ii) FEEDING

Fed or N.P.O.:

Fed - Total meal fed by nurse or continuous supervision during the meal.
N.P.O. - Infers tube feeding, gastrostomy feeding, etc. Exclude diagnostic procedures.

Partial Help:

Meal tray set up by nurse, followed by partial assistance, but not continuous supervision or frequent encouragement and teaching.

NOTE: If the patient requires no assistance with feeding once he has received his tray, nothing is marked under the FEEDING component.

Continued.....

iii) OBSERVATION

N.B.: One must recognize the difference between intensive medical therapy and the patient's need for intense nursing care when interpreting this component. This component should be interpreted very broadly.

- It infers observation of patient's state of well being and psychological support to patients, relatives and friends. Include the patient's need for explanation and teaching, e.g., new mothers, colostomy, diabetic, etc. Consider procedural activities in which nursing observation is the basic component, e.g., vital signs, dressings, I.V. infusions, deep breathing and coughing, medications, compresses, intake and output, care of drainage tubes, etc.

- Consider diagnostic tests, e.g., gastric analysis, lumbar puncture, Hollander test, 24-hour urine collection, etc.

- It could include a confused patient who is up in chair or up walking and requires surveillance at regular intervals.

The frequency of the observation will guide you in selecting the appropriate determiner:

CONSTANT to Q1H - Above Average or Intense
Q2H to Q4H - Average
Q4H or less - Minimal

iv) AMBULATION

In bed or chair with position and support:
Includes a bed patient who requires exercise, positioning and support with pillows or sand bags at least q2h. e.g. a helpless patient following C.V.A. or an immediately post-operative patient. Consider as well the patient who requires the above while in bed but is also lifted out of bed and positioned in a chair BID more frequently, e.g., quadriplegic, chronically debilitated dependent patient.

Bed Rest with BRP or up with Assistance:
Includes the patient who requires bed rest but changes his own position as necessary in bed. This patient may require assistance in getting out of bed as well as to and from the bathroom. Patients may require assistance with activity because of the presence of Levine tubes, I.V.'s, catheters, etc., or because of their general condition.

Continued.....

Up and About:

Patient does not require assistance with ambulation. He is up as tolerated or independent with the wheelchair. He has learned to manage non-restricting tubes such as catheters, T-tubes, or I.V.'s. A rehabilitated paraplegic could be considered in this group.

N.B. The two following determiners are above average or intense care determiners because they include psychological support and teaching as well as procedural activities involved.

v) OTHER DETERMINERS

Incontinence:

Patient does not have voluntary control over the excretion of bodily wastes;e.g. faeces, urine, fistula or sinus drainage, or patients with colostomies, ileostomies or ureterostomies.

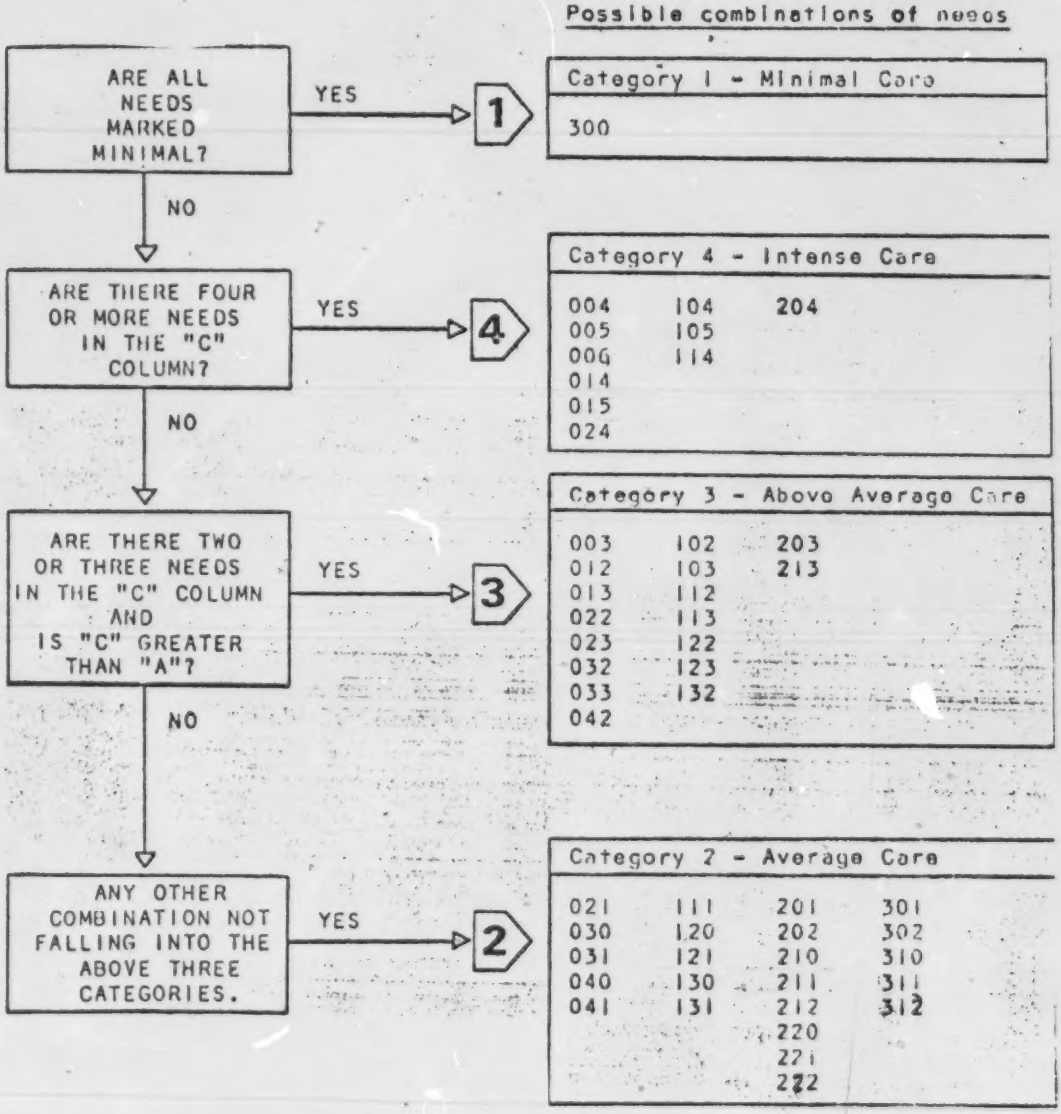
Pre-Op:

This column is checked the morning of surgery for all patients going to the operating room. Also includes any diagnostic procedures requiring extensive workup, preparation of the patient and frequent observation and follow-up, e.g. Cardiac catheterization, renal arteriogram, pneumogram.

Adaptation of HSSG form, September 1968
Revised by University Hospital, April 1972

FIGURE 11

GUIDELINES FOR INTERPRETING CATEGORIES



Possible combinations of needs

Category 1 - Minimal Care

300

Category 4 - Intense Care

004	104	204
005	105	
006	114	
014		
015		
024		

Category 3 - Above Average Care

003	102	203
012	103	213
013	112	
022	113	
023	122	
032	123	
033	132	
042		

Category 2 - Average Care

021	111	201	301
030	120	202	302
031	121	210	310
040	130	211	311
041	131	212	312
		220	
		221	
		222	

A - Minimal
B - Average
C - Above average and Intense

H.S.S.G.
Revised July 1972

in pediatrics, although alterations in the descriptions of indicators are necessary.

Virginia Mason Hospital

The Virginia Mason Hospital in Seattle, Washington, began its study of patient classification in 1971 (Hanson 1976). Modeled after the structural design introduced by Pardee (1968) earlier in that State, the system offers four care categories in a factor evaluation form (Figure 12, page 52). Twelve critical indicators are listed on the instrument, and those that pertain to each patient are checked. A set of definitions is available to aid in the appropriate selection (Figure 13, page 53). Two additional checks are already on the form, which represents a mathematical loading imposed by the developer. In this manner, the absence of an activity or condition is given some weight. After the appropriate checks have been made on the form, the columns are added, and the column with the highest total points is the patient's classification.

The classification instrument thus involves automatic assignment to the appropriate care category. The indicators selected for the classification instrument were drawn from a list of 72 activities that were used in an earlier direct patient care activity study. The 12 activities finally selected were found to have high correlations with the total nursing direct care-time when patients were divided into four groups. Time standards were established for each classification level and for indirect care, based on the activity study data and instrument testing data. Validation of the classification system in the study hospital as well as in two other hospitals has been reported (Hanson 1976). The procedure of validation involved direct patient care studies for 3 nonconsecutive days on each unit using self-recording by the nursing staff involved.

Patient classification is done once on the day shift to predict the evening staff, and once on the evening shift to predict both the night and the following day staff. The predictions are communicated to the nursing office where they are used in conjunction with other types of information to adjust staffing levels. The data are also entered into a computer for later analysis, including the monitoring of trends in staffing needs. To date, the patient classification system is appropriate only to medical-surgical patients.

San Joaquin General Hospital

A major study recently completed at the San Joaquin General Hospital, San Joaquin, Calif. (1976), focused on the development of methods for determining the use and effectiveness of nursing service personnel. A conceptual framework for staffing was developed, and various methods for collecting data on nursing activities were tested. The design of the classification instrument is similar to the Virginia Mason instrument,

FIGURE 12

VIRGINIA MASON PATIENT CLASSIFICATION

VMH -82

VS < QID	( ) ( )			
IV			( ) ( )	
BATH-SELF	( ) ( )			
ASSIST			( )	
COMPL.			( ) ( )	
FEED				( )
UP $\bar{S}$ HELP	( )			
DANGLE			( ) ( )	
CATHETER			( ) ( )	
LEVINE				( )
TURN			( ) ( )	
I & O		( )	( ) ( )	
	(✓)	(✓)		
	(✓)	(✓)		
TOTAL			.5	
CLASS (X)	1	2	3	4

FIGURE 13

DEFINITIONS FOR VIRGINIA MASON
PATIENT CLASSIFICATION

VS>QID	Vital signs include pulse, respiration and/or blood pressure, and are required less often than four times per day.
I.V.	Patient has an intravenous needle or catheter in place, including a heparin lock.
BATH-SELF	Patient requires no assistance with his bath beyond provision of equipment or facilities.
BATH-ASSIST.	Patient requires some help in the process of bathing but is able to perform a portion of the task independently.
BATH-COMPL.	Patient requires complete help with his bath and is unable to function independently in the process.
FEED	Patient requires assistance in feeding beyond preparation of the food (cutting meat, opening milk carton, etc.).
UP W/S HELP	Patient able to ambulate totally without help, including getting in and out of bed.
DANGLE	Patient requires assistance in sitting on the edge of the bed, and this is the limit of his ambulation activity.
CATHETER	Urinary catheter in place. Does not include other types of tubes.
LEVINE	Patient has levine or other gastric tube in place for suction (not feeding).
TURN	Patient requires assistance in turning in bed.
I & O	Patient's intake and output are recorded.

and the quantification approach is based on the Saskatchewan studies. Figure 14, page 55, and Figure 15, page 56, provide examples of the classification instrument and the guidelines used for selecting the appropriate determinant. An important outcome of the study is a soon-to-be-published "Manual To Aid Hospitals in Making Use of Personnel" (San Joaquin General Hospital, 1978). The manual provides the details of patient classification and describes the procedures for data collection and quantification. The manual is presently being tested in several acute care settings and when available should be a valuable aid to hospitals in allocating their nursing personnel resources.

Pediatric Classification Systems

The development of patient classification systems unique to pediatrics was necessitated by the general view that the typical medical-surgical classification system could not be readily transferred to the pediatric setting. It appeared that more basic nursing care was required on pediatrics because of the dependence of small children on adult support for activities of daily living. In addition, there appeared to be a need for more supportive care for parents and families. While the actual determinants of care used in many of the classification instruments specific to pediatrics do not differ greatly from the usual medical/surgical approach, the description of the indicators is directed toward pediatric examples, and the quantification is necessarily different in many respects. Although many of the preceding systems have made modifications which permit application to pediatrics, the following illustrations are taken from studies which focused primarily on refinements in this area.

Children's Hospital National Medical Center

The patient classification system developed by this hospital provides an example of a prototype evaluation and describes six categories of care (Figure 16, page 58). All patients are classified at least once a day, and several of the units extend this procedure to once every shift. The system is quantified *post facto* by distributing the total average hours of care deemed appropriate to each nursing unit, according to the averge mix of patients on a particular unit. For example, if a total of 5.5 hours of care was the established standard for one nursing unit, and if patients were found to be in only categories 1, 2, and 3, the distribution of 5.5 hours might be allocated so that category 1 patients received 1.5 hours; category 2 patients, 2.0 hours; and category 3 patients, 2.0 hours.

Similar calculations are performed for the evening and night shifts. A staffing guide which distributes the total average care-hours per category of patient and per shift has

FIGURE 14

SAN JOAQUIN GENERAL HOSPITAL

PATIENT CLASSIFICATION FORM

Hospital: _____ Date: __/__/__
Type of Unit: _____ Bed No.: _____
Unit: _____
Day of Study: _____ Patient ID:
Shift: D E N _____

PATIENT CLASS.	I	II	III	IV
Activity Independent	( )			
Bath, Partial Assist		( )	( )	
Position, Partial Assist		( )	( )	
Position, Complete Assist			( )	( )
Diet, Partial Assist		( )	( )	
Diet, Feed			( )	( )
I.V. Add. q 6 h or more or TKO		( )	( )	( )
Observe q 1-2 hrs.			( )	( )
Observe, Almost Constant				( )
	(√)	(√)		
TOTAL			.5	

Comments:

FIGURE 15

SPECIFIC GUIDELINES FOR CHECKING ACTIVITIES

Items indicating needs for care	Instructions
(1) Activity Independent	Check if patient takes own bath (basin at bedside, tub, or shower) with minimal supervision; manages own personal hygiene even if on maintenance I.V., catheter, etc.; moves from bed without help. Do not check if any of the following items number (2) through (6) are checked.
(2) Bath, Partial Assist	Can start own bath, but not complete it. Needs help to get to shower or tub, and supervision and encouragement during bath. Do not check if patient needs help only to wash back. Do not check if patient requires complete bed bath.
(3) Position, Partial Assist	Can assist in turning or positioning in bed; cannot move independently from bed to chair. Needs help in maintaining proper alignment (e.g., traction, foot board).
(4) Position, Complete Assist	Needs complete assistance in turning, positioning, and propping in bed or chair. This item also assumes patient cannot help with own bath. Do not check both "Partial" and "Complete Assist."
(5) Diet, Partial Assist	Can feed self after help in opening cartons, cutting meat, etc. May require supervision and encouragement to eat.
(6) Diet, Feed	Must be fed, or may need constant supervision and encouragement due to swallowing difficulty. Gastric gavage or gastrostomy tube feeding. Do not check both "Partial Assist" and "Feed."

FIGURE 15 (continued)

Items indicating needs for care	Instructions
(7) I.V. Additive every 6 Hours or More, or I.V. to be Kept Open	I.V. to be kept open (TKO) which requires frequent monitoring may be checked here even if patient is independently active.
(8) Observe every 1-2 Hours	Requires symptom observation and monitoring over and above I.V. checks and every 2-4 hour vital signs, e.g., hourly output, 15 minute neurological checks, vital signs until stable after surgery or diagnostic procedure.
(9) Observe, Almost Constant	Above reasons, plus special equipment, or problems requiring almost constant observation. Do not check both "Observe" items.
Weighting Factors	Pre-existing checks in Columns I and II are to be counted in the totals.
Total:	Add the number of checks and enter the total of each column, retaining the .5 weighting factor in Column III. Then cirle the patient classification (I, II, III, or IV) at the top. If the columns have the same total, circle the higher classification. The highest total possible is 5.5, which could be summed for Column III.
Comments:	Use this space to record special situations which may warrant a higher classification than is circled.

San Joaquin General Hospital

FIGURE 16

CHILDREN'S HOSPITAL NATIONAL MEDICAL CENTER

NURSING DEPARTMENT
PROCEDURE AND POLICY FOR CLASSIFYING PATIENTS

DIRECTIONS FOR USE OF CLASSIFICATION SHEET

1. All patients will be classified once daily on the day tour of duty. The complete report is sent to nursing administration by 1:00 p.m. each day. The ICU, NURSERY - ICU, AND 3 GREEN (BURN) UNITS WHO USE CATEGORIES 3-B, 4, 5, and 6 SHOULD CLASSIFY PATIENTS EACH TOUR OF DUTY. Classification reports for evening and nights must be sent to nursing administration by 9:00 p.m. and 5:00 a.m. to allow time for staffing adjustments to be made.

2. Changes in patient census and/or condition occurring after the classification shift is completed must be telephoned to nursing administration so that staffing adjustments can be made when indicated.

3. The Classification Report should be used by all nursing units on the evening and night tours of duty to document for the assistant directors, unstable patients or any unusual patient or unit problem. However, all patients do not need to be listed and patients listed need not be classified unless their classification has changed since the day tour of duty or they are new admissions or transfers.

4. Infants six (6) months and under should be classified in "Category III" since they meet few of A.D.L. by themselves. Patients three (3) years and younger should be classified in "Category II or III", never "I".

CATEGORY I:

Patient requires minimal nursing intervention and can meet all of the activities of daily living (A.D.L.) by himself.

EXAMPLE: Patient awaiting discharge, over 3 years or with a parent.

CATEGORY II:

Patient requires moderate nursing intervention and is able to meet some A.D.L. by himself. Constant Care patients are classified in this category to allow staff time for supervision of the constant care nurse.

FIGURE 16 (continued)

EXAMPLES:
1) PRN oral or naso-pharyngeal suctioning
2) n/g tube to suction
3) isolation (protection or otherwise)
4) semi-conscious
5) stable post-op patient
6) patient in hip spica or traction with limited mobility
7) continuous I/V
8) constant care patients

CATEGORY III - A:

Patient requires much nursing intervention and can meet few of A.D.L. by himself.

EXAMPLES:
1) post-op patient with I/V, hemovac, etc.
2) vital signs every three hours or more frequently
3) continuous oxygen therapy
4) close observation for: impending hemorrhage, hypo-hypertension
5) cardiac arrythmias, seizures, behavioral management, chest or abdominal tubes, unconscious

CATEGORY III-B:

Intermediate Intensive Care patients requiring more than normal nursing intervention and can not meet A.D.L.; requires staffing pattern of 3 patients to 1 nurse.

EXAMPLES:
1) premature requiring frequent monitor of vital signs, nipple and/or gauge feeding
2) oxygen therapy
3) suctioning to maintain airway
4) monitoring for cardiac arrythmias or irregular respiration

CATEGORY IV:

Comprehensive care - patient requires constant nursing intervention and cannot meet A.D.L.; requires staffing pattern of 2 patients to 1 staff member.

EXAMPLES:
1) vital signs every one hour or less (TPR, B/P, neuro, I & O, rhythm strip)
2) chest tubes
3) permanent pacemaker after 24 hours
4) cvp line
5) frequent deep suctioning
6) unconscious
7) marked emotional needs
8) tracheostomy care - 1st 48 hours
9) continuous oxygen therapy
10) close observation for: impending hemorrhage, hypertension and cardiac arrythmias

FIGURE 16 (continued)

CATEGORY V:

Critical Care - Patient unable to sustain A.D.L. by himself; unstable condition and nursing activities require staffing pattern of 1:1.

EXAMPLES:

1) life-threatening arrythmias
2) permanent pacemaker first 48 hours
3) patient with pacing wires being paced (continuous or intermittent)
4) shock-septic, hemorrhagic, cardiogenic
5) major mechanical equipment - respirator, CPAP, etc.
6) monitoring vital functions every one hour or more frequently
   - EKG
   - arterial monitor and flushing
   - drainage - urine, chest, gastrostomy
   - neuro signs
   - monitoring of multiple inter-cardiac pressures
7) peritoneal dialysis
8) endotracheal tube

CATEGORY VI:

High Risk - Unable to sustain A.D.L. and requires more than one person to care for him at a time.

EXAMPLES:

1) 2 or more cardiac or respiratory arrests within 24 hours.
2) massive hemorrhage.

been developed for each nursing unit to provide a rapid determination of staffing requirements. Deviations from the average number and mix of staff are noted, and adjustments are made on the basis of this information, coupled with the judgments of supervisory personnel. While this method does not completely satisfy the question of validation of the patient categories, it has been useful where established standards and practices have led to an accepted total average hours of care per patient.

Hospital for Sick Children, Toronto, Ontario, Canada

The systems engineering department of the Hospital for Sick Children, Toronto, Ontario, Canada, has developed a factor evaluation patient classification system for the quantative measurement of nursing care (Neufeld 1974, Jenkinson and Weinstein 1975). "NARVEL," the acronym for Nursing Attention Requirement Level, was developed after extensive studies of nursing care. It estimates the amount of nursing required for each patient. Validated against continuous observations of direct nursing care, it is used to forecast nursing needs for a 24-hour period by estimating the workload on each nursing unit. The NARVEL Classification Form (Figure 17, page 62) consists of five major components of care: (1) feeding, (2) basic care, (3) supportive care, (4) observation, and (5) therapy. A sixth component, location, applies only to some children (operating room, isolation, etc.).

For each of these components, a range of determiners may be selected, and a guide for the selection of the appropriate determiner is available and used by the nurses to ensure correct use (Figure 18, page 63). Reliability tests confirmed high agreement among nurses, and a control system ensured continued accuracy and consistency. A computer-assisted operation provides each nursing unit with a daily classification sheet which contains the names of all patients. The nurses on the unit designate the appropriate determiners for each patient, and a clerk then calculates the NARVEL index (representing minutes of time for giving direct care) for each patient. Staffing decisions are assisted by calculating individual workloads for all nurses. The system is operational in conjunction with a quality of care system developed along with the assessment study (Weinstein 1976). Although studies are still being conducted at the hospital, to date they have been unable to demonstrate a relationship between staffing and their quality of care assessments.

Psychiatric Classification Systems

To date, there does not exist a widely used or accepted patient classification system for psychiatric patients. Although several attempts at development have been made, the obstacles appear to be more formidable than those in other specialty areas. The application of medical-surgical classification

FIGURE 17

1. Print LAST NAME of each NURSE assigned for the morning shift (one letter per box).
2. Print LAST NAME of each PATIENT.
3. Enter the appropriate CODE for the nurse assigned to the patient.
4. Circle ONE item in each area of FEEDING, BASIC CARE, SUPPORT, OBSERVATION, and THERAPY.
5. Circle items in LOCATION only if applicable.
6. If care given differs from the prediction, slash the prediction out, and circle the revised figure. Update the figures in this way, as soon as the care levels change for any child.

HARVEL CLASSIFICATION FORM

WARD:
DATE:

CODE	NURSE'S NAME	CODE	NURSE'S NAME	CODE	NURSE'S NAME
01		02		03	
04		05		06	
07		08		09	
10		11		12	
13		14		15	

NO.	CHILD'S NAME	CODE	FEEDING	BASIC CARE	SUPPORT	OBSERVATION	THERAPY	LOCATION	COMMENTS
01			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
02			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
03			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
04			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
05			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
06			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
07			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
08			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
09			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
10			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
11			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
12			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
13			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
14			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
15			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
16			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
17			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
18			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
19			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
20			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
21			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
22			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
23			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
24			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
25			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
26			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
27			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
28			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
29			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
30			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
31			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
32			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
33			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
34			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
35			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
36			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
37			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
38			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
39			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
40			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
41			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	
42			1 2 3 4	1 2 3 4	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3	

RS20-(Rev. 11/76)

FIGURE 18

D E T E R M I N E R S

FEEDING

1. PREPARES SELF FOR MEALS, FEEDS INDEPENDENTLY. Does not require any nursing assistance once he receives his tray.
2. NEEDS TO BE PREPARED FOR MEAL, FEEDS SELF, NEEDS FOOD CUT OR ARRANGED, GROUP SUPERVISION, N.P.O. Feeds self but needs bed rolled up, overhead table positioned, food cut or arranged; or is fed by parent or volunteer.
3. 30 MINUTES OR LESS PER MEAL, INFANT FEEDING, CONTINUOUS NURSING ATTENTION TO FEED, ENCOURAGE OR SUPERVISE OLDER PATIENT. Patient is dependent on nurse for feeding (any type) or requires continuous personal supervision or encouragement from nurse.
4. MORE THAN 30 MINUTES PER MEAL. Infant slow feeder, or exceptionally slow requiring continuous meal time supervision from nurse.

BASIC CARE

1. INDEPENDENT FOR PERSONAL HYGIENE. Manages wheel chair or walking, fixes appliances, without any attention from nurse.
2. NURSE PREPARES NECESSARY ITEMS, SUPERVISES OR ASSISTS WITH BATH, PATIENT NEEDS LITTLE OR NO HELP WITH AMBULATION OR DRESSING. Patient may be up or on bedrest, but can do most of his own care if nurse brings basin, supervises him. May need nurse to wash his back or provide minimal assistance with ambulation or dressing.
3. BATHED BY NURSE, ASSISTED WITH BATH AND ALSO WITH AMBULATION OR BOWEL OR BLADDER ROUTINE. Toddler or easily positioned infant. Includes simple q1h, q2h, turning.
4. COMPLETE BATHING PLUS q1h, q2h TURNING, POSITIONING, SKIN CARE. Includes infants for whom positioning is time-consuming due to special attention to tubes, dressing, or frequent linen change and/or skin care.

EMOTIONAL AND SUPPORTIVE CARE

Emotional or Supportive Care is time spent with child or parents, in conversing, listening to, discussing, reading with, comforting, walking for social reasons, holding, cuddling, playing with ... It is nursing time spent solely giving supportive care, and it excludes time giving support concurrently with other nursing activity such as feeding or bathing. It has two aspects: (i) the time given to promoting normal growth and development of a child and/or to teaching the parent some aspect of this; and (ii) the time given to dealing with anxiety or with disturbed behaviour.

There are three observed levels at HSC. Out of ten children four are at Level 1, 5 at Level 2, and 1 at Level 3.

Level 1

Patient and/or parents are coping satisfactorily with child's illness and hospital stay. Nurses provide usual support considering child's age and hospitalization. Patient provides own diversion or is getting adequate attention and support from parents and/or other hospital staff.

Level 2

Patient and/or parents require help with specific emotional or teaching needs, which may be noted on Care Plan. More help in adjusting (explanations, discussion, demonstrations) is planned. Examples:

starting isolation admission explanations discharge instruction
follow up information toddler with moderate separation anxiety
anxious mother, but can accept explanation or discussion.

Level 3

Developmental, diagnostic or anxiety problems demand a lot of nurses' time. Examples:

complexity of condition causes severe anxiety patient in critical condition
multiple trauma admission patient/parents need much teaching
toddler with separation anxiety cannot be comforted intensive pre-op care
stage of terminal illness acute psychological problems
behaviour disturbance infant deprived of maternal care and nurse is surrogate mother (especially long-stay patient).

FIGURE 18 (continued)

OBSERVATION

1. OBSERVATION OF BEHAVIOUR IS LESS OFTEN THAN q4h. Patient requires infrequent vital signs, or other nurses' observations. Includes normal observation of signs, symptoms, behaviour.

2. q3h or q4h INTAKE & OUTPUT, SEARCH OUT OR TEST FOR SPECIFIC SIGNS & SYMPTOMS q3h, or q4h. Vital signs or other observations recorded q3h or q4h. Straightforward Intake & Output. Record specific observations not observed in course of other activities.

3. q1h, q2h FREQUENT OBSERVATION, SUPERVISION, IV, Vital signs or other nursing observations recorded one to two-hourly. Observation of respiration, of safety, of behaviour. Normal monitoring or regulating of IV. Intake & Output involving frequent nursing attention or weighing of linen.

4. CONSTANT OBSERVATION, q½h. Vital signs recorded more frequently than q1h. Nursing observation of clinical status on minute-to-minute basis. Nursing supervision of behaviour on minute-to-minute basis.

THERAPY

Note: This component refers both to nursing actions necessary to the medical plan of care and to specific nursing therapeutic measures. The nurse may either be doing them herself or be teaching, working with patient or parents. Determiners below should be selected on the basis of total nursing time needed to meet the patient's requirements. If two nurses are required to carry out total procedures, estimate double the time.

1. NO TREATMENT, or PRN ONLY. Patient requires no medications or therapy from nurses, or receives them on a prn basis only.

2. SIMPLE, BRIEF THERAPEUTIC MEASURES (TOTAL TIME 20 MINUTES OR LESS PER SHIFT) Includes easily administered medications, simple dressing, or other procedures.

3. STRAIGHTFORWARD THERAPEUTIC MEASURES (25 - 45 MINUTES PER SHIFT). One major procedure, or two or three requiring 15 - 20 minutes each.

4. INVOLVED THERAPUETIC MEASURES (TOTAL TIME 1 to 1¾ HOURS PER SHIFT).

5. MANY or COMPLEX THERAPEUTIC MEASURES. Patient requires procedures which take extreme amounts of nursing time, due to number, duration, or complexity. Includes complicated IV therapy, burn bath requiring two nurses for more than one hour, etc.

LOCATION Note: Check only if applicable.

1. ISOLATION Staff must scrub and gown, special treatment of materials and supplies or items leaving room.

2. POST-OP RETURN TO WARD. Includes any operation or procedure which will require repeated checking of vital signs on return to ward. Do not circle this determiner if patient will likely have vital signs checked only once on return, or if he is expected to go to ICU post-operatively.

3. ACCOMPANY OFF WARD AND REMAIN WITH PATIENT UNTIL RETURN. Circle this if the patient is scheduled to go off the ward, requiring a nurse to accompany him and to remain with him until he returns.

instruments in short-term psychiatric units has been reported, but the practice is not widespread. As was discussed in pediatric classification systems, the critical indicators of care are not universal. In large psychiatric care institutions which serve both short-term and long-term-care patients, classification has been generally limited to systems which identify major types of care for patient placement, for establishing global staffing standards, and for program planning. The following discussion of methods and studies is presented not as a sample of definitive psychiatric patient classification systems, but as a review of the state-of-the-art. Many developments are presented because of their importance pursuant to future work in this area.

St. Elizabeth's Hospital

During the early 1960's, a 12-category classification instrument was developed at St. Elizabeth's Hospital in Washington D.C.(Abdellah and Levine 1965). The prototype instrument which applies to patients not eligible for immediate discharge or rehabilitation closely resembles the classification instruments designed for progressive patient care. The classification information is used primarily for placement as an inventory to determine and support budgeted positions.

Veterans' Administration

A four-category prototype classification modeled after the early, Brooks Army Hospital System is used in a number of Veterans' Administration hospitals. Specific criteria and examples are outlined for psychiatric patients (Figure 19, page 66). The use of the patient classification information for the daily determination and allocation of nursing personnel at the unit or institution level appears to be limited, because staffing ratios are primarily established by the central office. Moreover, use of the instrument is voluntary, and rater reliability testing is not routinely monitored.

California Department of Mental Hygiene

In 1967, the California Department of Mental Health published a two-volume report on staffing standards which contained a patient assessment instrument. The system, identified as "SCOPF," an acronym for Staffing the Care of Patients Effectively, provides a means for identifying the care requirements of resident patients and converting the requirements into work load through the application of standard time values. Although the patients are not assigned to categories of care, they are assessed in each of three areas. These include: (1) treatment program, (2) daily living, and (3) domiciliary care functions. The assessment form includes the patient's level of dependence in activities of daily living, status in terms of mentally ill or mentally retarded, frequency of medications, behavior, medical regimen, physical handicaps, and IQ test score (See Figure

FIGURE 19

VETERANS ADMINISTRATION CLASSIFICATION OF PATIENTS ACCORDING TO THEIR NURSING CARE NEEDS

Category I -- Psychiatry

A patient who requires intensive nursing care. This requirement will be manifested by:

1. A patient who shows extreme symptoms, physical and/or emotional. This patient is completely dependent upon nursing personnel to provide each aspect of physical care, i.e., bathing, dressing, feeding, elimination and other supportive care.

2. A patient whose behavior pattern is overt and exaggerated. This behavior will manifest itself in extremes of mood, sensory distortion, which interfere with normal activity and may produce combativeness, ideas of suicide, impulsive behavior, withdrawal, inability to cooperate, and inability to communicate.

3. A patient whose activity must be rigidly controlled because of physical incapacity and/or psychotic, or neurotic distortions in order to protect the patient and to fulfill the therapeutic mission.

4. A patient who requires continuous treatment and/or observation and/or instruction.

Examples:

1. This patient is on observation status because of suicidal tendencies -- requires special nursing assistant off the ward to clinics and activities. May need constant supervision when he continues to pace hall or be hyperactive. Daily personal hygiene must be done by nursing assistant.

2. Patient in a catatonic stupor, incontinent of feces or urine, tube fed, and needs frequent baths and changes of bed linens and bed gown. Care to prevent decubitus ulcers.

3. A bed patient requiring maximum nursing care due to unstable vital signs, having severe muscular contractions during which he could do injury to himself. He may have a tracheotomy requiring frequent aspirations and must be tube fed due to his severe spasms. These patients require frequent turnings to prevent pressure sores and may require complete toilet care. Most head injuries would require this intense nursing care.

4. This patient exhibits extreme hyperactivity. His behavior is impulsive and purposeless. He is hostile, resentful and initiates unprovoked attacks of violence and destruction. His speech is rambling and constant with many bizarre thoughts expressed throughout. His preoccupation results in unrealistic thinking and little cause or interest in his untidiness, lack of personal appearance and hygiene, and excretory habits. He demands much attention and requires constant surveillance and assistance with his activities of daily living.

5. Behavior pattern manifested by rapid mood swings from state of no response to extreme agitation, associated with attempts of self-mutilation, self-destruction. When not agitated, shows extreme opposite behavior, withdrawing physically from everyone. Continuous suicidal observation.

6. A patient who is in acute state of increased psychomotor activity. His hyperactivity makes it necessary that all physical activity be controlled in order to prevent him from becoming physically exhausted and "burned out". He is a menace to other patients and continually picks fights, thus endangering himself because of his aggressive behavior. All of his physical needs are cared for because his hyperactive state does not allow him to give any care to himself.

7. The patient is often hostile and makes many demands on both patients and personnel. He can manipulate everyone and everything and because of this requires firm control. The real nursing challenge is to direct this patient so that his interpersonal relations will be less traumatizing. At times his tension is so great that he physically strikes out; therefore, if this energy can be channeled into some useful activity, a bad situation is averted.

Category II -- Psychiatry

A patient who requires less intensive nursing care. This requirement will be manifested by:

1. A patient whose extreme physical and/or emotional symptoms have subsided, or have not yet appeared, usually termed moderately ill. This patient is dependent upon nursing personnel to provide some assistance in each aspect of physical care, i.e., bathing, dressing, feeding, elimination and other supportive care.

2. A patient whose behavior pattern deviates moderately from the normal. This overt behavior pattern is frequent, and may, or may not interfere with daily routine or treatment. He requires reassurance, encouragement and other emotional support.

FIGURE 19 (continued)

3. A patient whose activity must be partially controlled in order to protect the patient and others and to fulfill the therapeutic mission.

4. A patient who requires periodic treatment and/or observations and/or instructions.

Examples:

This patient requires being escorted to activities and back to ward. Requires being fed most of meal, must be bathed and dressed. Requires being taken to bathroom frequently. Patient received medication 3 times a day and receives injections occasionally for hyperactivity. Also receives a continuous tub each morning. Patient is given supportive reassurance and encouragement by all nursing personnel.

Patient is confused, disoriented, and preoccupied. Nursing personnel must issue clothing and direct patient to bathe; requires some assistance with dressing. Must be escorted to and from clinics and all other activities. Requires frequent reminders to proceed with ADL in order to accomplish these activities. Loses or permits others to take canteen books and cigarettes; requires one to help with purchases from canteen cart and in canteen; nursing personnel hold cigarettes for him and issue them on request during day. Manageable on ward and in small to moderate-sized (10-12) groups. Subject to sudden, brief episodes of assaultiveness requiring constant awareness to prevent altercations and possible injuries.

This patient with a progressive muscular disturbance is confined for the most part to a wheelchair. He has periodic episodes of confusion, depression, and irritability. He lacks insight and judgment, shows an increasing memory impairment, and often expresses claims and beliefs in grandiose schemes and delusions. He is combative upon the slightest provocation, has brief emotional outbursts, completely neglects his personal appearance and hygiene, but his appetite is excellent. With intense supervision, he will bathe himself, comb his hair, and change his clothes. He insists on feeding himself and will eat everything edible placed before him. He has urine incontinence, but controlled bowel habits.

A patient who is withdrawn from reality and apparently lacking in appropriate emotional response to ordinary stimuli. If left alone he enjoys his own thoughts and imaginings. He must be given support in returning to reality and must be encouraged to live in the world around him. Nursing personnel must give frequent assistance and guidance in order that the patient is stimulated to respond to things about them and to be interesed in providing for their own needs. This type patient probably will be

included in a plan of physical and emotional rehabilitation. He usually is ambulatory, but slow, is nonprivileged and does not participate in any program unless encouraged to do so, or unless some type of motivation is supplied by nursing service personnel. The nurse is expected to direct and lead activity into normal channels and to create new interests and to revive old ones.

Category III -- Psychiatry

A patient who requires a moderate amount of nursing care. This requirement will be manifested by:

1. Behavior which deviates from normal in some areas such as ritualization, compulsion or preoccupation to such a degree that it interferes with his ability to accomplish his activities in a reasonable time and manner.

2. The patient requires encouragement, reminders and some assistance in order to accomplish activities of daily living and guidance in caring for his personal articles. He requires emotional supportive interpersonal relationships on a continuing basis.

3. The patient may have a chronic medical or surgical condition concomitant with a psychiatric condition which requires medication and/or treatments several times a day; however, the patient is able to accept responsibility for performing routine activities of daily living and requires only routine instruction and little observation.

Examples:

This patient is usually ambulatory and privileged. He is expected to care for his own physical needs and is expected to attend daily therapeutic assignments without escort. He is eligible for short community visits and participates freely in ward, station and community activities.

Patient is an apathetic individual who is emotionally flat. He seldom changes facial expression and, therefore, it is difficult to note any mood swings in relation to whether or not he is sad or glad. He regularly attends his assignment; however, he occasionally refuses to attend his detail. He socializes well enough in the ward situation, but generally speaking is considered a "loner" because he sticks pretty much to himself. He requires a minimum amount of supervision, needing occasional reminders to change his clothes and polish his shoes. A routinized type of program seems to fit his needs.

This patient has and is responding well to drug therapy. He is a cooperative participant in ward activities, and he attends an assignment in which he expresses much

interest. He sometimes gets discouraged with his progress, but he readily seeks encouragement and counseling at these times. He needs assistance and encouragement in socialization. He likes and adjusts fairly well to short community visits.

Patient mobilizing self to leave hospital. Currently undergoing psychotherapy that elicits some anxiety and defense after sessions. Is developing insight and establishing stress and work tolerances again. Needs help in developing self-confidence and in socialization processes. Is fully privileged, on self-medication and does not abuse passes or privileges. The patient is able to care for his own needs or knows how and where to seek assistance. He participated in most ward programs and feels some responsibility toward other patients. Has some verbalized fears of "what people will think" when he goes home from the hospital and starts work. Needs assistance in utilizing understanding. Slight element of depression persists, but relates well to people in general.

Category IV -- Psychiatry

A patient requiring minimal nursing care whose condition is characterized by:

1. Behavior which is apparently normal in all respects. He is totally independent in all activities of daily living and cares for his personal belongings, makes his own bed and cares for his own immediate environment. He attends prescribed activities and keeps his appointments with minimal reminders.

2. Occasional individual or group counseling may be required. Is on self-medication or medication is not given more than once a day.

Examples:

Patient is on night status. Manages all his activities and personal possessions. Works out necessary arrangements with employer when he has clinic appointments, annual physical, interview with physician, etc. On Sunday or scheduled day off will seek out nursing personnel to discuss any problems or questions he might have. Nursing personnel make themselves available to this patient for this type of individual, informal counseling.

This patient accepts full responsibility for the normal self-care of himself and his personal belongings. He may be occupied on, or employed away from the hospital setting and is capable of following directions in handling any daily routine. This patient is dependent on the hospital personnel to keep him informed and to assist him in any changes or problem situations.

Extracted from circular 10-63-255,
Department of Medicine and Surgery,
Washington, D.C.

20, page 72). Standard times, based on direct time study and work sampling, have been developed for each of the patient characteristics. The system represents an interesting departure from the more common prototype evaluations in psychiatric facilities. It permits staffing standards to be based on individual rather than global patient requirements. How responsive the system is to changes in patient requirements will depend on the frequency of application. Reliability testing among nurse raters is not mentioned. (California Department of Mental Hygiene, 1967)

Saskatchewan Hospital Systems Study Group

In 1973, the Hospital Systems Study Group of the University of Saskatchewan, Canada undertook a study of patient classification systems in the psychiatric setting (Giovannetti and McKague 1977). The study, conducted in four Canadian institutions, had as one of its objectives the development of a classification instrument unique to the total care requirements of short-term psychiatric inpatients. A multidisciplinary consulting group with representatives from the participating institutions developed a four-category factor evaluation instrument. Four major components of nursing care were identified as the critical indicators of care. These included: (1) "basic care," (2) "observation and supervision," (3) "somatic therapies," and (4) "psychosocial therapies." Each component was represented by a four-point continuum ranging from "minimal" to "intensive care" (See Figure 21, page 73). The fourth component of care, psychosocial therapies, was intended for use by other health care professionals as well. Social workers, occupational therapists, and psychologists could categorize patients in terms of this component alone. However, all four components were necessary to categorize patients according to their nursing care requirements.

Following implementation of the instrument in the four study hospitals, continuous observation of direct patient care was conducted. The purpose was to establish predictive validity and to identify the quantification coefficients necessary for determining staffing. When the direct care study times were analyzed, the average care-times provided to patients did not always correspond with the patients' designated category of care. In some instances; for example, category I patients (minimal care) received more care than did category II patients (average care). The classification instrument therefore did not have predictive validity in all of the study settings.

The negative findings of the study are important. Some problems which appear to be unique to psychiatric settings and the selected methodology were identified. First, the mobility of the patient was thought to be responsible for some of the apparent discrepancies in direct care-time. Through the standard approach to determine direct care-time, all nurse-patient interactions were recorded as direct patient care. Patients

FIGURE 20

CALIFORNIA STATE DEPARTMENT OF MENTAL HYGIENE
SCOPE RATING (REV. 12/66)

WARD NO. | TODAYS DATE: MONTH | DAY | YEAR

PATIENT IDENTIFYING DATA

ADDRESSOGRAPH IMPRINT

PATIENT CHARACTERISTICS

A. BATHING		1. SELF
		2. WITH ASSISTANCE
		3. COMPLETE
		4. BEDBATH
B. FEEDING		5. SELF
		6. WITH ASSISTANCE
		7. COMPLETE
C. AMBULATION		8. AMBULATORY
		9. PARTIAL
		10. WHEELCHAIR
		11. BEDFAST
D. DRESSING		12. SELF
		13. WITH ASSISTANCE
		14. COMPLETE
E. PHYSICAL SIZE		15. OVER 115 LBS.
		16. 76 TO 115 LBS.
		17. 36 TO 75 LBS.
		18. UNDER 36 LBS.
F. TOILETING		19. CONTINENT
		20. INCONTINENT
G. SEX		21. MALE
		22. FEMALE
H. PATIENT CATEGORY		23. MENTALLY ILL
		24. MENTALLY RETARDED
I. DAILY ORAL MEDICATION FREQUENCY		25. NONE
		26. ONCE/DAY
		27. 2 TIMES/DAY
		28. 3 TIMES/DAY
		29. 4 TIMES/DAY
J. MEDICAL/PHYSICAL STATEMENTS		30. APPLY TO PATIENT
		31. DO NOT APPLY
K. BEHAVIORAL STATEMENTS		32. APPLY TO PATIENT
		33. DO NOT APPLY
L. PHYSICAL HANDICAPS		34. NONE OR MILD
		35. MODERATE
		36. SEVERE
M. IQ TEST SCORE (M.R. ONLY)		37. ABOVE 80
		38. 40 TO 80
		39. BELOW 40

FIGURE 21

PSYCHIATRIC PATIENT CLASSIFICATION STUDY

2nd Draft
April, 1973 HSS

WARD _____

DATE _____

ROOM & BED	NAME OF PATIENT	BASIC CARE				OBSERVATION & SUPERVISION				SOMATIC THERAPIES				PSYCHO-SOCIAL THERAPIES				TOTAL					
		INDEPENDENT	PARTIALLY DEPENDENT	FULLY DEPENDENT	EXTENSIVE	MINIMAL	PARTIAL	CLOSE	CONSTANT	LIMITED ASSISTANCE	INTERMITTENT	INVOLVED	EXTENSIVE TREATMENT	UP TO 15 MIN.	15 TO 30 MIN	30 TO 60 MIN	OVER 60 MIN	MINIMAL	AVERAGE	ABOVE AVERAGE	INTENSE	CATEGORY	COMMENTS
		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		

who may not have been perceived by nursing personnel to require a great deal of direct care-time, could effectively increase their care-time by contacting a nurse.

Second, the critical indicators of care were perhaps not sensitive to the therapeutic freedom of the psychiatric nurses in the study. For example, given the same patient on 2 consecutive days and with no changes in the patient's perceived requirements for care, the assigned nurse may select nursing approaches which entail vast differences in the amount of time that she will spend with the patient. Third, since much nursing care-time is provided through group activities, the special needs or dictates of some members of the group may supersede the requirements of others. Many other related problems are important for future developments in this area.

In addition to these studies, a few other reports of classification systems have been recorded (Pile and others 1968, Ontario Ministry of Health 1968, Indiana State Department of Mental Health 1970, McMaster University Medical Centre 1972, St. Luke's Hospital Medical Centre 1974, Lyons and Young 1976). In summary, it is apparent that patient classification for determining major types of care for placement, program planning, and global staffing standards has been used extensively in psychiatric facilities. Refinements of these systems to determine and allocate nursing personnel, particularly in short-stay units, have not been satisfactorily attained.

Long-Term Care Classification Systems

Patient classification in long-term care facilities has only recently been a major focus of attention. Although experience gained in studies of acute care has been instrumental in the recent developments, modifications have been necessary to address the unique aspects of aging and chronic disease. In an excellent review of studies in this area, Young (1976) described the importance of the initial work of Katz (1963) in recognizing the significance of activities of daily living as they relate to nursing services, and also McKnight (1967) in determining the amount and type of care received by nursing home patients in the Denver, Colorado area. Substantial insight and guidance were also provided by the work of Salmon and others (1966 and 1967) and Burack (1965). By 1968, the difficulties of patient assessment for long-term care were instrumental in the formation of a coalition of several resaerch groups.

Case Western Reserve, Harvard, Johns Hopkins, and Syracuse Universities

The major contribution in the area of long-term care has been the multidisciplinary work of four research groups which

collaborated to develop a single multipurpose patient classification system (Jones 1973). This work is somewhat analogous to the progressive patient care phase of patient classification in the acute care setting. The investigators recognized that a widely agreed and reliable method for describing observations in the field was necessary to delineate long-term care problems. The classification developed is known as "Patient Classification for Long-Term Care." The criteria and structure of the classification instrument are important.

First, it was based on descriptions of the patient rather than on the setting in which he is located. Second, it uses multidimensional descriptors to describe the patient's status along a number of axes. These axes include physical function, impairments, medical risk status, and sociodemographic status, all of which are considered essential to the development of a care plan or the determination of the level of care needed. Third, the criteria are stated in objective terms to eliminate observer opinion as much as possible. Fourth, the selection of criteria for classification was mostly based on scientific evidence that there is a relationship between the item and the outcome of patients. Fifth, it was structured to maximize flexibility so that its uses could be expanded. In this manner, the descriptors can be further delineated to permit any amount of detail.

To date, the practical applications have assisted in monitoring the quality of care; policy-making for long-term care; and research, education, and training. Densen and Jones (1976) reported that most experience with patient classification so far has been in institutional settings such as chronic disease hospitals and nursing homes. Some extension has been made for ambulatory care patients, while modifications may have to be made to patients living in the community and for assessing children with chronic disease or disability.

Other excellent references which summarize the state-of-the-art in this area include Sherwood (1975); Murnaghan (1976); and the U.S. Department of Health, Education, and Welfare (1976). The careful construction of this patient classification instrument, which considers many axes of patient status, has resulted in a superb general classification that permits easy modification to meet a variety of specific needs. However, the application to manpower planning for nursing resources has not received much attention to date, but the potential is there.

The Johns Hopkins University

Based on the collaborative effort, The Johns Hopkins University focused on the development of a patient classification system specifically for nurse staffing in long-term-care facilities (Young 1976, Cavaiola 1975). Nonlinear multiple regression techniques were applied to data obtained for 37 health status indicators contained in the classification instrument

which had been developed by the 4 universities. These indicators were used to classify patients into three levels of care: (1) "skilled nursing," (2) "intermediate A," and (3) "intermediate B." Various subsets of the 37 variables were tested for their predictive power, and a subset of 12 variables was found to be valid for an implementable patient classification procedure. The 12 variables, along with their factor weights, compose the "Patient Classification Form" (Figure 22, page 77). The assessment rating scales used to select the appropriate descriptor for each patient are displayed in Figure 23, page 78. The ability to classify patients into appropriate levels of care, coupled with the knowledge of the amount and kind of care to be provided for each level, permits an estimate of the nursing staff required to respond to the care requirements of the patients. Efforts are currently being directed toward testing the instruments and procedures outlined in this system in long term care facilities.

Sunnybrook Medical Centre

The Community Systems Foundation, Ltd., in cooperation with Sunnybrook Medical Centre, Toronto, Ontario, Canada, has adopted a four-category prototype evaluation to estimate the nursing workload (Community Systems Foundation, Ltd. 1977). The classification system is based on the earlier work of Queen Elizabeth Hospital, Toronto. Four levels of care are identified and described in "Patient Classification, Extended Care" (Figure 24, page 80). The head nurse on the unit assesses the patients according to their nursing care in relation to 13 headings on the classification form. "Guidelines to Interpretation of Patient Classification" is presented in Figure 25, page 81. The point values established for the quantification of the categories are shown on the "Patient Assessment Form" (Figure 26, page 83. The system was used initially to determine the numbers and levels of nursing personnel required for a new extended-care facility. Patient classification is now completed by the head nurse once a month, and the information is allocated to monitor the levels of care. Changes in the mix of patients are used to plan for changes in staffing patterns.

FIGURE 22

LONG TERM CARE

Patient Classification Form

Name _____ I.D.# _____ Room _____

Directions: Assess the patient with respect to the items below in accordance with the attached rating scale. Multiply the score obtained by the factor indicated and sum the results. Find Total 1 and Total 2 as shown, then consult the enclosed table to obtain values for Class B, Class A, and Class S. The maximum of these three numbers yields the Estimated Classification (Int. B, Int. A, SNF)

Item #	Description	Factor	Assessment	Factor x Assessment
1	Mobility	-0.3		
2	Walking	0.1		
3	Stair Climbing	-0.4		
4	Bathing	-0.6		
5	Dressing	-0.4		
6	Eating/Feeding	-0.6		
7	Toileting	0.4		
8	Behavior (Type)	0.3		
9	Cigarettes	0.6		
10	Anemia	0.6		
11	Mental Illness	-1.8		
12	Chron.Res.Dis.	-1.0		

Total = _____

Total 1 = Total ÷ 1.8 = _____

Total 2 = Total ÷ 4.5 = _____

Class B = Value of Total 1 = _____

Class A = Value of Total 2 - Value of Total 1 = _____

Class S = 1 - Value of Total 2 = _____

Class = _____.

THE JOHNS HOPKINS UNIVERSITY

FIGURE 23

LONG TERM CARE

Assessment Rating Scales

(Note: HA means Human Assistance, MA means Mechanical Assistance)
[from: Patient Classification for Long-Term Care: User's Manual]

Item	Description	Score	Interpretation
1	Mobility Level	0	Gets outside without either MA or HA
		1	Gets outside with MA but without HA
		2	Gets outside with HA, with or without MA
		3	Confined to institution, moves about without HA or MA
		4	Confined to institution and moves about with MA but without HA
		5	Confined to institution, moves about with HA, with or without MA
		6	Confined to bed or chair
2	Walking	0	Walks without MA or HA
		1	Walks with MA but without HA
		2	Walks with HA but withoug MA
		3	Walks with HA and MA
		4	Does not walk (bed or chair)
		5	Does not walk (bedfast)
3	Stair Climbing	0	Goes up and down flight of stairs without HA or MA
		1	Goes with MA but not HA
		2	Goes with HA but not MA
		3	Goes with MA and HA
		4	Does not perform
4	Bathing	0	Bathes self without assistance
		1	Bathes self with MA only
		2	Bathes self with HA, with or without MA
		3	Does not bathe self
5	Dressing	0	Dresses self without assistance
		1	Dresses self with MA only
		2	Dresses self with HA, with or without MA
		3	Does not dress self
6	Eating/Feeding	0	Feeds self without assistance
		1	Feeds self with MA only
		2	Feeds self with HA, with or without MA
		3	Does not feed self, is fed
		4	Does not feed self, tube fed
		5	Does not feed self; parenteral administration of fluids

FIGURE 23 (continued)

Assessment Rating Scales, Continued

Item	Description	Score	Interpretation
7	Toileting	0	Uses toilet room without assistance
		1	Uses toilet room with MA only
		2	Uses toilet room with HA, with or without MA
		3	Does not use toilet room
8	Behavior (Type)	0	Appropriate
		1	Inappropriate, wandering or passive
		2	Inappropriate, abusive or aggresive
		3	Inappropriate, other
9	Cigarette Smoking	0	Not current smoking
		1	Smoking less than 15 cigarettes/day
		2	15-24 cigarettes/day
		3	25 or more/day
10	Anemia	0	Not present
		1	Present (Aplastic, pernicious, folic acid, sickle cell, or combinations)
11	Mental Illness	0	Not present
		1	Present
12	Chronic Respiratory Disease	0	Not present
		1	Present (Asthma, chronic bronchitis, emphysema, removal of one lung (pneumonectomy))

FIGURE 24

PATIENT CLASSIFICATION, EXTENDED CARE DIRECTIONS FOR HEAD NURSES

Patient classification is a method of assigning patients to levels of care according to their nursing care requirements. Patients may be assigned to one of the four levels:

Level I Would cover patients who are completely independent, who require the minimal nursing care, that is, those who are ambulatory, well oriented and self-motivated, e.g. patients admitted for short term care and assessment, or pending discharge to more suitable accommodation.

Level II Covers patients who require assistance with feeding, dressing and ambulation, e.g. rehabilitated C.V.A.'s, spinal and head injuries. In other words, these are patients who are rehabilitated with the motive and potential to return to the community.

Level III Patients at this level have increased deterioration in their general conditions, therefore their dependence is greater. Because of this, more supervision and physical assistance in many of their daily activities is required. No great improvement in their condition is expected, but they do not necessarily have to deteriorate rapidly, unless an acute illness intervenes, and they may or may not be confused. Rehabilitation, however, is attempted on some patients of this level, the selected ones being C.V.A.'s, multiple sclerosis in the remission stage, arthritis, and senile dementia.

Level IV The vital processes are unstable, therefore care and supervision is constant. They may or may not be unconscious, but need supportive therapy. Examples of these are deeply comatosed patients from severe brain or heart damage, or patients who are in the terminal stages of their disease.

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FIGURE 25

GUIDELINES TO INTERPRETATION OF PATIENT CLASSIFICATION

(1) Stage of Illness

It is expected that most patients will be classified as being in a chronic stage of illness. If the patient is critically ill on the day of classification (i.e. acute pneumonia), he/she would be classified as acute on those days. Chronically ill patients in terminal stages of their disease would be classified as chronic.

(2) Level of Consciousness

Self-explanatory.

(3) Stability of Disease

Only those patients whose conditions vary greatly from day to day would be classified as unstable.

(4) Procedures Involved

Total the points for all the procedures listed. Only those to be carried out on that day are applicable.

Other special treatments refers to such procedures as instillation of eye drops or eye ointments, special skin treatments, etc.

(5) Motivation

Patients who are highly motivated receive no score. Those who show a considerable degree of motivation but require re-inforcement receive a score of two (2). Patients with little motivation, who require a great deal of staff support are scored as having some motivation and receive a score of five(5). Patients who are completely unmotivated, or too confused or physically debilitated to participate are scored as not motivated and receive a score of ten (10)

(6) Medications

Only non-routine drugs such as antibiotics, insulin by reaction, and short term ordered drugs are scored here.

(7) Fluid Control

Patients on push fluids will be recorded here as extra.

(8) Dressings

Minor dressings refers to unsterile dressings, and small sterile ones. Major dressings are such as large decubiti dressings.

(9) Psychological State

Co-operative patients receive no score. If none of the descriptions appear appropriate, score as other. Restraints required refers to the patient requiring restraints for psychological reasons (such as confusion). The score for restraints is added to the psychological state score and recorded as one figure.

(10) Degree of Dependence

If the patient is totally independent of staff for bathing purposes, feeding, dressing, and ambulation, score as independent (0).

If the patient requires infrequent staff assistance once or twice weekly with a tub bath, still score as independent. If the patient requires daily staff assistance with bathing, feeding, dressing or ambulation score as semi-dependent(4). A completely dependent patient is one who is totally dependent on staff for two or more, or all of the above described activities.

(11) Supervision and Observation

Routine supervision would apply to those patients who are completely independent and oriented. Frequent supervision would apply to those patients who are physically debilitated, but oriented and require more frequent observation due to their physical limitations.

Frequent supervision would apply as well to those patients who require assistance with activities of daily living, but once up would be ambulatory around the ward or in a wheelchair. Constant supervision would apply to patients who require very frequent observation due to their physical state or psychological state.

(12) Family Status

If the patient has relatives or friends who are interested and involved with the patient, he receives no score. If the relatives/friends are not interested, or if the patient has no family/friends he receives a score of (5).

(13) Rehabilitation Teaching

Refers to those patients who are currently receiving in their plan of care active rehabilitation nursing by nursing staff in the unit in any of the areas described under the heading. It applies only where the staff have assessed the patient having a potential for improvement and have instituted a plan of care for that patient. It does not apply to patients who have to have any or all of these activities done for them by staff.

FIGURE 26

PATIENT ASSESSMENT FORM

LEVEL I = 0-21
LEVEL II = 22-40
LEVEL III = 41-79
LEVEL IV = 80+

STAGE OF ILLNESS	
Acute	10
Chronic	6
Remission	5
Convalescent	6

LEVEL OF CONSCIOUSNESS	
Conscious	0
Semi-Conscious	10
Unconscious	10

STABILITY OF DISEASE	
Stable	0
Unstable	8

PROCEDURES INVOLVED	
Tube	4
I.V.	5
O_2	6
Tracheotomy	8
Postural Drainage	4
Catheter, Condom, Colostomy or Other Drainage	5
Suction	8
Inhalation Therapy	5
Other Special Treatments	4
Irrigations (bladder)	5
Prosthesis	3
Isolation	6
Enema	5
TPR	3
B/P	3
[illegible]nges	4

MOTIVATION	
Not Motivated	10
Some Motivation	5
Moderately Motivated	2
Highly Motivated	0

MEDICATIONS	
Routine	0
Non-Routine	6

FLUID CONTROL	
Restricted	4
Ad-Lib	0
Extra	6

DRESSINGS	
None	0
Minor	2
Major	6

PSYCHOLOGICAL STATE	
Co-operative	0
Unco-operative	8
Confused	4
Aggressive	4
Depressed	5
Other	5
Anxious	5
Restraints required	3

DEGREE OF DEPENDENCE	
Completely Dependent	8
Semi-Dependent	4
Independent	0

SUPERVISION & OBSERVATION	
Routine	0
Frequent	6
Constant	10

FAMILY STATUS	
Relatives/Friends Interested & involved	0
Disinterested	5
No Relatives/ Friends	5

REHABILITATION TEACHING	
Bowel & Bladder Training	6
Washing & Dressing	8
Transferring	6
Gait Training	5
Feeding	8

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V. MAJOR ISSUES IN SELECTION AND DEVELOPMENT

The present demand for patient classification systems from within the nursing profession suggests their importance and value in assisting with the difficult and complex problems of nurse staffing. In the face of a paucity of rational and supportable means for determining staffing policies, the question is less frequently "Should I use a patient classification system?" than "How do I select a patient classification system?"

Critical Indicators of Care

The descriptors of patients' requirements for nursing care used in classification systems are frequently referred to as the critical indicators of care. Critical is used here not in the medical sense, but rather in reference to those components or indicators that are most crucial to the correct identification of the appropriate category of care. Since the primary purpose of patient classification systems is the determination of nursing care time, the critical indicators represent those activities which, if they occur, will have the greatest impact on nursing care time. Observations of nursing care followed by statistical techniques such as regression analysis of the data have been instrumental in identifying the critical indicators. Typically, they include nursing activities associated with feeding, bathing, and ambulation. Other major activities observed and cited as critical indicators include those activities associated with preoperative preparation, observations, special treatments, and incontinence care. Given the nature of the nursing function, the universality of the critical indicators displayed in most classifications is not surprising.

The number and scope of critical indicators identified in patient classification instruments have received a great deal of criticism, most of which revolves around the issues of their seemingly lack of comprehensiveness and limited attention to the psychosocial and educational components of nursing care. Some of this criticism is perhaps warranted, but much is not. Several observations are important in understanding these issues. First, although patient classification requires assessment of the patient, it is not comprehensive, nor does it replace the need for more detailed patient assessment. Second, much of the psychological, social, and teaching requirements of patients are met by nurses while providing the nursing care related to feeding, bathing, ambulation, and other physical or technical functions of care.

Thus, the inclusion of critical indicators specific to emotional support and teaching is often redundant but may be included to enhance acceptability of a patient classification

system. Third, the subjective nature of the classification systems permits the consideration of psychosocial and teaching requirements of patients in the selection of critical indicators. For example, a patient may be physically capable of bathing himself but because of his emotional state or level of anxiety be unable to do so without encouragement and support from his nurse. In this instance, the critical indicator most appropriate to his care would be "bath with assistance" or perhaps, if warranted, "complete bath," rather than "self-bath."

This fact is not likely to be revealed by a cursory view of the classification instrument itself, but is frequently mentioned in the accompanying guidelines or instructions. In analyzing classification instruments, one must give attention to the guidelines and/or instructions for the selection of determiners which accompany almost all classification systems. Finally, it is possible to classify patients into four categories of care using less than four critical indicators. However, these systems are uncommon, not because they are invalid, but because they have not generally been acceptable to the nursing profession. They do not appear to consider the magnitude of nursing care nor the uniqueness of each patient.

Quantification of Patient Care

Almost all patient classification instruments are used in conjunction with some quantification or estimation of the nursing care time associated with each category of care. Although many approaches have been cited, two quantification approaches are common. One is based primarily on average care-times for each patient category, and the other is based on standard care-times associated with specific nursing procedures. In the first instance, from observations, the average amount of direct nursing care provided to patients within each care category is determined. The number of patients in each care category multiplied by the corresponding average care-time provides an estimate of the total average direct care-time required. This figure, coupled with an estimate of the total indirect care-time, indicates the total nursing care-time required for a specified group of patients. In the second approach, a standard time is calculated for each major nursing care activity. Total direct care-time is determined by multiplying the frequency of occurrence for each activity by the appropriate standard time. Total care-time is then usually determined by the addition of a constant which represents the residual indirect care-time.

Whether the system uses average care-times, standard times for procedures, or a combination of both, the approaches are less important than the data collection techniques and the manner in which the studies are conducted. A number of techniques

are commonly used to determine patient care-times, and in addition to quantifying the patient classification instrument, the same techniques may be used to validate the classification system. An understanding of the techniques is important because they can vary greatly in terms of time, cost, and accuracy. For determining direct patient care, four methodologies are commonly used: (1) continuous observation of patients by specially trained observers, (2) direct care sampling by specially trained observers, (3) self-recording of direct patient care by nursing personnel, and (4) direct patient care profiles which use predetermined standard times and self-recording of the frequencies of the selected procedures by nursing personnel. Indirect nursing care-time is generally determined by work sampling methods using either trained observers or self recording by nursing personnel.

Regardless of the specific technique, attention must be given to both sample size and representativeness of the data, as well as to the important inservice education which must be conducted to prepare and inform all personnel involved. While a particular classification instrument may be transferred from one institution to another, the quantification coefficients are not necessarily transferable. Average care-times or standard times may not be the same from institution to institution or even from one nursing unit to another within an institution. Many factors affect the determination of care-times, such as type of nursing organization employed, physical facilities design, treatment modalities, physician practices, availability of nursing personnel skills, and attitudes of treatment personnel. This requires institutions interested in using a patient classification system to determine their own quantification or index of workload.

Several options are open. The first involves selecting the quantification figures developed by a similar institution and then proceeding, on a trial-and-error basis, to adjust them to the new setting. Although this is far from the method of choice for institutions not in a position to invest any greater effort, a procedure has been outlined (Giovannetti and McKague 1973). In the second option, the institution conducts its own studies for both direct and indirect care. The procedures established to assist institutions with this task can be found in the reports by Giovannetti and McKague (1973), which provide procedures for continuous observation of direct patient care and work sampling for indirect nursing care activities, and by San Joaquin General Hospital (1978), which includes procedures and forms for direct patient care sampling, total nursing personnel activity sampling, and staff perception of the adequacy of care given. The latter report is intended to supplement an earlier publication prepared by the U.S. Public Health Service(1964) which was based on only work sampling of personnel. Other options include the hiring of outside consulting firms or management engineering and systems personnel.

Because of the nature of the quantification techniques discussed, the data obtained relate directly to the practices, procedures, and behaviors at the time of the observations. For this reason, inefficiencies and outmoded practices should be identified and corrected and the coefficients appropriately adjusted. In this way, the average care-times or standard times will not reflect and perpetuate inefficient practices. Regardless of the approach taken, the quantification of patient care to estimate workload should not replace professional nursing judgment and experience.

Reliability And Validity

The issues of reliability and validity of patient classification systems are extremely important ones. As with any instrument or measuring device, some estimate or assurance of both reliability and validity must be established before they can be used with any confidence. Several procedures are available, although depending on the type and purpose of the instrument certain measures are more important than others.

Reliability refers to the consistency or repeatability of the classification instrument and it is defined as a correlation coefficient. Different procedures for determining reliability are used, depending on the problems or concerns of the instrument in question. Two major types of reliability coefficients are important to patient classification instruments: (1) coefficients of stability and (2) coefficients of equivalence. Coefficients of stability are generally identified as test-retest reliability, the application of the same instrument on two separate occasions. Since patient classification instruments are not self-administered, coefficients of stability are determined by comparing the results of two or more persons classifying the same patient at the same time. This is commonly referred to as interrater reliability.

Correlation coefficients which are high provide evidence that the same category of care will be determined by different nurse raters. A reliability coefficient of 0.9 is necessary to provide an agreement of over 80 percent. Reliability is not an all-or-nothing matter; there are degrees of reliability. Also a high reliability coefficient does not mean that the instrument is reliable forever. Most classification instruments during their development stages have been tested for reliability, although the procedures and results have been infrequently documented. Nevertheless, once the instruments have been transferred to another setting, interrater reliability must again be established and maintained.

The most effective way to ensure a high coefficient of stability, or interrater reliability, is through an inservice education program for all members of the nursing staff who may

classify patients. Once an acceptable level of reliability has been achieved, periodic checks should be made to ensure that reliability continues. Some institutions have implemented a monitoring system which focuses on the patients classified as category III or IV, the intensive care categories. The rationale for this approach is that misclassifications in these categories have the greatest impact on staffing decisions. Also, because of the generally small numbers of patients in these categories, the data can be checked with minimal effort. Interater reliability may also refer to comparisons between nursing units, as well as between institutions.

To date, the impetus for the use of patient classification instruments has come primarily from within institutions resulting in little effort being expended on reliability testing between institutions which use the same instrument. One investigation attempted to determine this measure of reliability as part of an extensive study concerning both reliability and validity of a five-category subjective (prototype evalution) patient classification instrument (Giovannetti and others 1970). In this study, several levels of nursing personnel were transported between five hospitals which varied in size in order to classify a sample of patients. The findings revealed that a high degree of reliability among different levels of nursing personnel within a hospital, as well as between hospitals, was difficult to achieve with the instrument tested.

As nurses became more familiar with the classification instrument, they became more accurate in their assessments. This finding supports the view of many that a significant period of training is required to ensure high reliability both internally and externally. The study also reported that if one allowed a difference between raters of one adjacent category, agreement among the different raters exceeded 98 percent. The importance of the interrater reliability between different institutions which use the same classification instrument remains academic unless one is interested in comparing the mix of patients between institutions. This will become more significant in the future as regional planning boards and cost review commissions begin considering patient classification as one measure of the nursing personnel resource requirements.

Coefficients of equivalence are known as parallel forms or alternative forms. In terms of patient classification instruments, this refers to the reliability coefficient that would be obtained by comparing the results of two different classification instruments on the same group of patients. A recent study comparing the Saskatchewan and the San Joaquin patient classsification instruments, both of which are of the factor evaluation type containing four categories, found an agreement of 99 percent, allowing for one category difference. No patients were misclassified in the fourth "intensive care" category (Kelly 1977). This investigation, as well as many similar but unreported tests, was conducted primarily to determine which

instrument was considered the most appropriate and acceptable to the nursing staff. Measures of equivalence, like measures of stability between institutions, become important only when comparisons between institutions need to be considered.

Validity determination is a much more difficult and complex problem. Validity refers to the extent to which an instrument actually measures what it purports to measure. When applied to patient classification, if the question of validity relates to whether or not the instruments measure patients° actual needs for nursing care, an unequivocal "no" must be the answer. To date, none of the instruments have demonstrated validity in terms of actual need. It is unlikely that this validation can ever be shown satisfactorily. A great deal of criticism of patient classification instruments focuses on this point and is partly due to misunderstanding of terminology. Part of the confusion has arisen from the persistence of those involved in the development of patient classification systems in saying that their instruments group patients according to their nursing care needs. More accurately, they are instruments for grouping patients in terms of the amount of nursing care to be received according to a predetermined standard of care or according to their perceived nursing care requirements.

With these objectives, the question of validity is more appropriately discussed. The three most common types of validity are: (1) content, (2) criterion-related, and (3) construct, each of which is associated with the major purpose of the instrument. Unlike reliability, where the procedures for estimating are based on data and yield a correlation coefficient, some of the procedures for estimating validity are not data based and do not yield a statistical estimate. Content and criterion-related validity have been demonstrated and are important to patient classification. Content validity has no empirical basis and relies generally on judgment. The usual procedure is to present the criteria for classification to a panel of nurse experts who, through a process of systematic examination, assure thay they are representative of a specified universe of content.

This procedure is commonly reported, although few studies have described the process in detail. In her study of the University of Arizona patient classification instrument, Berry (1974) established content validity and described the process in detail. A weaker form of validity, face validity, is sometimes equated with content validity. Face validity involves nothing more than agreement among the developers or users that the instrument seems reasonable and obtains reasonable data. It is not based on any hard evidence or systematic process and should not be considered as satisfactory evidence of validity. However, it does have value in terms of acceptance of the instrument by nursing personnel.

Criterion-related validity is frequently discussed in terms of concurrent and predictive validity. Concurrent validity is established by comparing the classification instrument with another instrument designed for the same purpose. The Johns Hopkins classification has been the testing instrument most commonly used (Giovannetti and others 1970, Berry 1974). This type of validity testing is open to question, because of the difficulty in accepting the major premise that another classification instrument is valid in other settings. Moreover, it is sometimes difficult to distinguish concurrent validity from reliability testing of the different instruments. Since the major purpose of a patient classification instrument is the determination of nursing personnel care-time, evidence of predictive validity becomes important. This has been demonstrated many times; patients are classified into care catgories and, following observations of the care received, evidence is obtained that patients within each category receive the average amount of nursing care established for their specific category.

While the issue of predictive validity is resolved in this manner, another issue is raised. We may be locked into an allocation system that does not adequately reflect the nursing care that patients truly need. In other words, we may be forced to continue delivery of direct nursing care in the same manner as that which occurred during the time of validation. We should feel uncomfortable with this situation, but the problems are not with the classification instrument or even with the measure or quantification of each category of care. The problems are: (1) the reliance on patient classification instruments to make decisions rather than to facilitate the decision-making process and (2) the absence of a mechanism whereby changes in the quantification index will be made to reflect changes in nursing practice.

Validity is a matter of degree rather than an all-or-nothing property. In addition, the process of validation is unending. Once having obtained some evidence of validity, patient classification instruments should be kept under surveillance to see that they are continuing to behave in the manner intended. In summary, the selection and implementation of a patient classification system requires recognition that: (1) the systems are based on a unidimensional and partial assessment of patient requirements for care; (2) quantification is primarily based on the existing practice of nursing; and (3) even though the systems should be used as minimum data sets, their value will be greatly diminished if adequate measures of reliability and validity have not been obtained.

VI. LIMITATIONS OF PATIENT CLASSIFICATION

Undoubtedly, the most significant limitation of patient classification systems is that they tend to formalize the practice of nursing care in terms of the status quo. Some investigators have attempted to resolve this issue by expressing the standards of care in terms of the desired direct care-times and then estimating the requirements of the patients in terms of the standards (Bahr and others 1977, Chagnon and others 1976). Instead of basing care-times on the care that was observed, they are based on what nurses think the patient should get. Although the methodological problem associated with observing what is rather than what should be appears to be resolved, there is no evidence to support the contention that the care provided to the patient changes in any way. This limitation will likely remain unresolved until the relationship between nursing practice, standards of care, and quality is identified. Patient classification systems are also limited in their ability to accurately predict workloads for periods longer than one or two shifts. Wandel and Hershey (1974) reported a number of studies which attempted to overcome this mainly by using Markov models with transitional probabilities. Some of the previously mentioned studies which relate to patient dependency chains also represent efforts in the direction of improving the range of predictability.

Much of the criticism directed at patient classification systems for nurse staffing focuses on what the systems cannot do, and in many cases on what the systems were never intended to do. Part of this criticism is helpful to the profession, because it encourages investigations into some very important areas. The most significant example of this has been in the area of quality of care research, where efforts are being made to define nursing practice operationally and to develop outcome criteria for the evaluation of nursing care. The quantity of nursing care is one factor important to the quality of care; however, we do not know at what point we begin to get diminishing returns. Similarly, we have no evidence to support the allegation that an understaffed unit does not provide quality care. The development of outcome measures will enable the identification of a productivity formula which considers the level of quality as well as the volume of nursing output and which is sensitive to changes in both.

VII. FUTURE DEVELOPMENTS

As noted in the discussion of the theory of classification, the standard nomenclature of the time becomes the basis for the identification and ordering of groups. Thus, the patient classifications described use the nursing care activities that are evident in the provision of patient care. As the nomenclature changes, so will the basis of the classifications. Two relatively new nomenclatures to describe the nursing process are now beginning to emerge: (1) patient problems and (2) nursing diagnosis. It seems reasonable to expect that as the validity of these descriptions becomes more evident, one or both may well lead to new patient classification systems which, in turn, may be more responsive to the true nature of the patients' care requirements.

Classification systems should be based on a theoretical framework which reflects the concept of nursing. As the conceptual model changes, so must the classification system. If they are not responsive to such changes, they will encompass components of nursing care which may be inconsequential to the true efforts of nursing, and their value will be greatly diminished. As the number of institutions which use patient classification systems increase, efforts may be directed toward standardizing the patient classification systems used. The systems presently are not necessarily comparable between institutions. The same care categories may have very different quantification coefficients in different hospitals. Studies must be completed to determine the comparability between institutions which use the same classification system as well as different classification systems and to identify the factors that are significant in producing different care-times.

Standardization of patient classification systems would enable regulatory agencies to evaluate the effectiveness of the management of nursing resources more objectively and to make more valid comparisons between hospitals possible. Efforts are already moving in this direction in Canada, where categorization of patients or clients has been recommended for all levels within the health care sector (National Health and Welfare 1973, MacDonell 1976). The efforts to standardize patient classification information will require that research be conducted to thoroughly evaluate the existing systems. As suggested by Young (1975), more effort should be devoted to implementing fully and evaluating thoroughly existing models for staffing and resource allocations rather than developing even more esoteric models which merely modify and refine basic concepts already well known.

VIII. CONCLUSIONS

It is not enough to leave to chance that the correct numbers and mix of personnel will be available to respond to the nursing care requirements of patients. When developed and used appropriately, patient classification systems can be highly useful to aid in the effective determination and allocation of nursing resources. Benefits have been derived from such use, not only in the short-term daily allocation of staff, but also in long-term budget planning as well. Patient classification systems have also proved useful in developing more effective facilities in which to provide care. Their heuristic nature has been beneficial to many research investigations, and particularly as a guide for the recent studies relating to criteria for quality of care measures (Jelinek 1974). In addition, several hospitals are using patient classification systems as a basis for determining patient charges.

Perhaps one of the least credited or obvious advantages of a well-developed and operational patient classification system is its ability to free nursing time and energies from the monumental problems associated with the determination and allocation of nursing personnel. Freed from some of the daily struggles associated with staffing, nurses may transfer their energies to other current and critical problems such as implementation of standards of care and the development of outcome measures of quality. Many other uses of classification systems have been cited, but their capabilities are highly contingent on the degree of understanding and acceptance within a facility. Understanding involves awareness and knowledge of their capabilities, with particular emphasis on the issues of reliability, validity, and quantification. Understanding also involves recognition of their limitation: a patient classification system is a necessary but not sufficient condition for quality.

Acceptance must extend beyond the nursing department to include hospital administration and physicians. The lack of attention directed to this crucial step in the execution of any change has unquestionably been the major reason for the failures in the implementation and successful application of the systems experienced by some. Imperfect as patient classification systems may be in determining the true needs of patients, when used appropriately they do provide a more rational approach to the problem of nurse staffing. Most users would like to see improvements, but of those using a well-developed patient classification system, there are few who would give it up to no system at all.

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